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UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF TEXAS
HOUSTON DIVISION

IN RE APACHE CORP. SECURITIES
LITIGATION

Case No. 4:21-cv-00575

EXPERT REPLY REPORT OF ZACHARY NYE, PH.D.

August 11, 2023

Table of Contents

I.	Background and Qualifications.....	1
II.	Scope of Engagement	1
III.	Bases for Opinions.....	2
IV.	Ms. Allen’s Price Impact Analysis Is Incomplete and Unreliable Given Her Failure to Analyze “Front-End” Price Impact—That Is, Whether the Alleged Misrepresentations Affected Apache’s Stock Price When Made	3
V.	Ms. Allen Has Adopted an Incorrect and Overly Narrow Interpretation of Lead Plaintiffs’ Allegations in This Matter	14
VI.	Ms. Allen Fails to Demonstrate a Lack of Price Impact Associated With the April 23, 2019 Alleged Corrective Disclosure	18
VII.	Ms. Allen Fails to Demonstrate a Lack of Price Impact Associated With the October 25, 2019 Alleged Corrective Disclosure	30
VIII.	Ms. Allen Fails to Demonstrate a Lack of Price Impact Associated With the March 16, 2020 Alleged Corrective Disclosure	40
IX.	Ms. Allen’s “Big Picture Analysis” Fails to Demonstrate That the Alleged Misstatements and Omissions Lacked Price Impact During Her “Focus Period”	48
X.	Ms. Allen Improperly Conflates Statistical Significance and Price Impact	55
XI.	Use of a Multi-Day Event Window Is a Reliable and Scientific Methodology for Estimating Price Impact.....	63
XII.	Ms. Allen’s Alternative Event Study Does Not Have “Higher Explanatory Power”	67

I. Background and Qualifications

1. Previously in this matter, I submitted the Expert Report of Zachary Nye, Ph.D., dated April 7, 2023 (the “Nye Report”), in which I opined that:

- i. The common stock of Apache Corporation (“Apache” or the “Company”) traded in an efficient market during the period from September 7, 2016 through March 13, 2020, inclusive (the “Class Period”).¹
- ii. Damages under §10(b) of the Securities Exchange Act of 1934 (“Exchange Act”), and Rule 10b-5 promulgated thereunder by the SEC, can be calculated using a method that is common to each Class member and in a manner consistent with Lead Plaintiffs’ theory of liability, for investors who purchased or otherwise acquired Apache stock during the Class Period.^{2, 3}

2. My qualifications are set forth in ¶1 of the Nye Report. My curriculum vitae, which includes my academic research, publications in the past ten years, and prior expert testimony in the past four years, is attached hereto as Exhibit 1.

3. My current hourly rate is \$990. In preparing this Report and the Nye Report, I have received assistance from individuals at SCG, who worked under my direction; their fees charged for this project are their standard hourly rates. Neither my compensation nor that of any individual at SCG is contingent on the outcome of this litigation.

II. Scope of Engagement

4. In connection with preparing this Report, Counsel for Lead Plaintiffs in this matter, Plymouth County Retirement Association and the Trustees of the Teamsters Union No. 142 Pension Fund (“Lead Plaintiffs” or “Plaintiffs”), have asked me to reply to the Expert Report of Lucy P. Allen, dated June 16, 2023 (the “Allen Report”), in which Ms. Allen provides certain

¹ Nye Report, §VI.

² Nye Report, §VII.

³ The claims in this action are set forth in the Consolidated Class Action Complaint, dated December 17, 2021 (the “Complaint”).

opinions on price impact associated with the alleged misrepresentations during a portion of the Class Period.^{4, 5}

III. Bases for Opinions

5. My opinions expressed herein are based upon my professional knowledge and experience, my review of documents and information relevant to this matter, and the analyses described in this Report and in the Nye Report. Documents, data, and other information that I have relied upon as bases for my opinions are cited in this Report and in the Nye Report. Such documents and information are typically relied upon by financial experts in securities class actions and by financial economists in their research.

6. Counsel for Plaintiffs have informed me that the record in this matter continues to be developed and that fact discovery is ongoing. To the extent relevant, I would expect to review additional information that may become available through discovery as well as the reports and depositions of other expert witnesses. The opinions offered in this Report are subject to refinement or revision based on continuing analysis of the documents and information listed above, as well as new or additional information that may be provided to or obtained by me in the course of this matter.

⁴ Ms. Allen was deposed in this matter on July 27, 2023 (the “Allen Deposition”).

⁵ Ms. Allen does not contest my opinion that Class-wide damages can be calculated using a method that is common to each Class member and in a manner consistent with Lead Plaintiffs’ theory of liability. Nor does Ms. Allen contest my opinion that Apache common stock traded in an efficient market during the Class Period. Instead, Ms. Allen was “asked to assume Plaintiffs’ claim of market efficiency.” (*See* Allen Report, ¶1.)

IV. Ms. Allen’s Price Impact Analysis Is Incomplete and Unreliable Given Her Failure to Analyze “Front-End” Price Impact—That Is, Whether the Alleged Misrepresentations Affected Apache’s Stock Price When Made

7. In her Report, Ms. Allen states that she was “asked by counsel for Defendants to analyze whether there is price impact from the alleged misrepresentations that Plaintiffs claim inflated the stock price of [Apache].”⁶ She further states that she was “asked to focus [her] analysis on the time period between February 23, 2018 and March 13, 2020 (the ‘Focus Period’) and analyze whether there is a link between any of the alleged misrepresentations made during the alleged ‘Class Period’ (the period between September 7, 2016 and March 13, 2020) and Apache’s stock price during the Focus Period.”⁷ As part of that assignment, Ms. Allen admits that she only “analyzed the market reaction following the alleged misrepresentations during the Focus Period.”⁸ She also purportedly analyzed only “the three alleged corrective disclosures during the Focus Period, i) April 23, 2019, ii) October 25, 2019, and iii) March 16, 2020, and whether there is any link to any of the alleged misrepresentations.”⁹ Notably, Ms. Allen does **not** offer any opinion pertaining to the alleged misrepresentations or corrective disclosures issued during the portion of the Class Period preceding her limited Focus Period—*i.e.*, beginning with the start of the Class Period on September 7, 2016, when Apache first announced its discovery of a “world class” and “significant new resource play” in an area of the Permian Basin known as Alpine High, through February 22, 2018, the date of the second alleged corrective disclosure (the “Pre-Focus Period”).

⁶ Allen Report, ¶1.

⁷ Allen Report, ¶1.

⁸ Allen Report, ¶35.

⁹ Allen Report, ¶1.

8. As described in the Nye Report, “[p]rice impact can be shown either by an increase in price following a fraudulent public statement or a decrease in price following a revelation of the fraud.”¹⁰ Ms. Allen acknowledges that “the price impact of an alleged misrepresentation can be analyzed in at least two ways: (1) directly by analyzing the market reaction following an alleged misrepresentation, including analyzing the stock price movement and examining market and analyst commentary following the alleged misrepresentations, or (2) indirectly by analyzing the market reaction to a disclosure that is corrective of an alleged misrepresentation.”^{11, 12}

Conspicuously, however, Ms. Allen omits any analysis of the how the alleged misrepresentations and corrective disclosures affected Apache’s stock price during the Pre-Focus Period.¹³ In fact, her price impact analysis, by design, fails to address 14 of the 17 alleged misrepresentation dates,^{14, 15} and the two alleged corrective disclosures,¹⁶ that occurred prior to February 23, 2018.

¹⁰ Nye Report, footnote 130, quoting *Erica P. John Fund, Inc. v. Halliburton Co.*, 718 F.3d 423, 434 (5th Cir. 2013), *vacated and remanded on other grounds*, *Halliburton Co. v. Erica P. John Fund, Inc.*, 134 S. Ct. 2398 (2014) (“*Halliburton II*”).

¹¹ Allen Report, ¶20.

¹² See Allen Deposition, 50:25–51:10 (confirming that a price reaction to an initial misstatement is evidence of price impact); 53:1–10 (same); 55:21–24 (also confirming that a price reaction to a corrective disclosure is evidence of price impact); 56:3–9 (same).

¹³ See Allen Deposition, 12:14–13:6 (confirming that Ms. Allen has not conducted any analysis of price impact over the portion of the Class Period that predates the Focus Period); 75:18–25 (same); 106:17–24 (same).

¹⁴ See Complaint, ¶¶191–257, for a description of the 17 alleged misrepresentation dates that occurred between September 7, 2016 and February 22, 2018.

¹⁵ Ms. Allen briefly discusses the alleged “misstatements on February 23, 2017, August 3, 2017, and February 22, 2018 about Alpine High being economic at low commodity prices.” (See Allen Report, ¶43.)

¹⁶ The first alleged corrective disclosure occurred after market close on October 9, 2017, when “Apache hosted a webcast to provide the Company’s first ‘detailed review of the [] progress we are making at Alpine High’ since announcing the ‘discovery’ on September 7, 2016,” and “revealed for the first time that it was experiencing significant problems extracting oil from the Woodford and Barnett formations within Alpine High.” According to the Complaint, “[a]s a

9. Most notably, Ms. Allen simply ignores Plaintiffs’ allegations of price impact at the beginning of the Class Period, when “Apache made a grand announcement on September 7, 2016, hyping Alpine High’s attributes, performance, and commercial viability.”^{17, 18}

Nonetheless, she still manages to opine that “a detailed analysis of the Focus Period shows no price impact and no link with any of the alleged misrepresentations made during the [entire] alleged Class Period.”¹⁹ However, Ms. Allen fails to demonstrate a complete lack of price impact during the Class Period because her Report nowhere addresses whether any of the alleged misrepresentations made during the Pre-Focus Period positively impacted the price of Apache’s common stock, or whether any of the alleged corrective disclosures made during the Pre-Focus

direct result of the October 9, 2017 partial corrective disclosure revealing Alpine High’s significant oil production problems, Apache’s stock price declined by more than 7% in a single day, falling from a close of \$45.85 per share on October 9, 2017 to close at just \$42.46 per share on October 10, 2017.” (See Complaint, ¶¶304, 305.)

The second alleged corrective disclosure occurred on February 22, 2018, when “Apache issued a pre-market press release announcing the Company’s earnings for the fourth quarter and full year of 2017,” and “also announced disappointing 2018 production growth guidance.” According to the Complaint, “[a]s a direct result of the February 22, 2018 partial corrective disclosure regarding lower than expected BOE production guidance for Alpine High, coupled with an increasingly unfavorable Alpine High gas/oil ratio and prolonged production time frame, Apache’s stock price plummeted to its lowest point in nearly 15 years, falling from \$37.20 per share on February 21, 2018 to close at \$34.85 per share on February 22, 2018, a decline of more than 6%.” (See Complaint, ¶¶307, 308.)

¹⁷ Memorandum and Recommendation of United States Magistrate Judge Andrew M. Edison, filed September 15, 2022, Dkt. 76, p. 7. See also Complaint, ¶¶191–203.

¹⁸ See Allen Deposition, 77:4–25 (confirming that Ms. Allen did not analyze price impact associated with Defendants’ alleged misstatements made on September 7, 2016); 119:16–23 (confirming that Ms. Allen did not analyze whether Apache’s stock price experienced a statistically significant increase in response to the September 7, 2016 alleged misrepresentations).

¹⁹ Allen Report, §VII (emphasis added and title capitalization omitted).

Period fully dissipated all of the positive price impact created by the Pre-Focus Period alleged misstatements.²⁰

10. According to Ms. Allen’s “review of the Complaint, [she] do[es] not understand Plaintiffs to be claiming that the alleged misrepresentations **during the Focus Period** increased the alleged inflation in the stock price when made.”²¹ However, while one may not expect Apache’s stock price to have increased significantly following the Focus Period misrepresentations, many of which allegedly served to **maintain** the then-existing level of price inflation by “emphatically reassur[ing] investors with promises of a ‘world class resource play [at Alpine High] that will change the course of Apache,’”²² this is certainly not a reasonable inference with respect to Lead Plaintiffs’ allegations regarding Defendants’ misrepresentations at the start of the Class Period, on September 7, 2016. Specifically, in the Complaint, Plaintiffs detail how: (i) “Apache’s stock price immediately rallied on the news of the ‘world class’ Alpine High discovery, soaring 14% in the first two days after the announcement, reaching \$59.33 per share on September 8, 2016—its highest price in over a year”;²³ (ii) “[a]nalysts and the financial press credited Defendants’ positive statements and celebrated the discovery”;²⁴ and (iii) “[t]he financial press, industry

²⁰ See Allen Deposition, 76:1–4 (confirming that Ms. Allen is not expressing an opinion that no price impact existed during the Pre-Focus Period); 76:19–22 (confirming that Ms. Allen did not analyze whether the two alleged corrective disclosures made during the Pre-Focus Period demonstrate price impact for the Pre-Focus Period misstatements); 76:23–77:1 (confirming that Ms. Allen did not analyze whether there was front-end price impact for any of the Pre-Focus Period misstatements); 78:1–7 (confirming that Ms. Allen has not analyzed whether any price inflation that came into Apache’s stock price during the Pre-Focus Period had fully dissipated prior to the start of the Focus Period).

²¹ Allen Report, ¶35 (emphasis added).

²² Complaint, ¶80.

²³ Complaint, ¶39.

²⁴ Complaint, ¶40.

press, and mainstream media also praised Apache’s Alpine High discovery,” including “the ideal economics of Alpine High Defendants had touted.”²⁵

11. Indeed, Plaintiffs effectively employ Ms. Allen’s own methodology for assessing price impact—*i.e.*, “analyzing the stock price movement and examining market and analyst commentary following the alleged misrepresentations”²⁶—to articulate a theory of liability in which Defendants’ alleged misrepresentations caused Apache’s stock price to increase on and shortly after September 7, 2016, thereby creating price inflation at the outset of the Class Period. As stated in the Complaint, “[t]hese misstatements created in the market an unrealistically positive assessment of Apache’s prospects at Alpine High and, consequently, of its business prospects as a whole, thus artificially inflating the Company’s stock price.”²⁷ Ms. Allen did not analyze, and therefore offers no rebuttal to, these allegations of positive “front-end” price impact.

12. Moreover, Plaintiffs allege that, “[t]hroughout the rest of 2018 and into 2019, Defendants continued to relentlessly promote Alpine High as a transformative discovery for Apache, while consistently waving off doubts about the play’s oil or wet gas potential and profitability,”²⁸ thereby “maintain[ing] artificial inflation in the price of Apache common stock [during the Focus Period].”²⁹ Without analyzing the extent to which the alleged misrepresentations made prior to February 23, 2018 impacted Apache’s stock price, Ms. Allen has no basis to opine, nor does she opine, that the alleged artificial inflation in Apache’s stock price suddenly vanished at the onset of her Focus Period. Again, Ms. Allen does not even consider the price impact of the two

²⁵ Complaint, ¶41.

²⁶ Allen Report, ¶20.

²⁷ Complaint, ¶190.

²⁸ Complaint, ¶83.

²⁹ Complaint, ¶301.

alleged partial corrective disclosures that occurred during the Pre-Focus Period (*i.e.*, October 9, 2017 and February 22, 2018), much less analyze whether these corrective disclosures fully dissipated all of the positive price impact created by the prior alleged misrepresentations made during the Pre-Focus Period (which she also did not consider). Given that Ms. Allen's price impact analysis is deliberately and demonstrably incomplete, she cannot reliably opine on whether there is "a link between any of the alleged misrepresentations made during the alleged 'Class Period' ... and Apache's stock price during the Focus Period."³⁰

13. Consistent with Plaintiffs' allegations, Exhibit 11B to the Nye Report shows that Apache stock did in fact experience three consecutive statistically significant price increases following Defendants' initial misrepresentations regarding Alpine High on September 7, 2016.

Specifically, under my event study, Apache's stock price increases on September 7, 8, and 9, 2016 are statistically significant at the 99.96%, 97.58%, and 98.18% confidence levels, respectively.³¹ Similarly, Ms. Allen's alternative event study finds statistically significant price increases for these days at the 99.92%, 98.90%, and 97.63% confidence levels, respectively.³²

My review of news and analyst reports during this period also supports Plaintiffs' allegations that investors received the announcement of Alpine High positively. Analysts, along with financial news outlets, attributed the increase in Apache's stock price to the Alpine High announcement, with several directly linking this positive price impact from the Alpine High announcement to specific false statements alleged in the Complaint (illustrated below in italics).³³ For example:

³⁰ Allen Report, ¶1.

³¹ Nye Report, Exhibit 11B, p. 1.

³² Source: NERA_019129.

³³ Several analysts also increased their price targets for Apache stock following the announcement. (*See Exhibit 2 which lists analysts' price targets and rating actions before and after September 7, 2016, as reported by Bloomberg.*)

- **Associated Press (9/7/2016):** “Apache shares rose \$3.46 to close at \$55.13, but at one point jumped 14 percent when news of the possible [Alpine High] find began to surface.”³⁴
- **Bloomberg First Word (9/7/2016):** “Apache shares up 10% after confirming discovery of significant new resource play, the ‘Alpine High,’ in southern portion of Delaware Basin, primarily in Reeves County, Texas; analyst see update as a catalyst, however market may need to see longer-term results.”³⁵
- **BMO Capital Markets (9/7/2016):** “Apache’s announcement of having secured 307,000 net acres in the Southern Delaware Basin could represent a significant source of future liquids-rich inventory, but little is known about the area termed Alpine High. While peers are paying \$20-40,000 per acre in more established Permian areas, Apache accumulated this position at only \$1,300 per acre. ... Apache’s stock price already reflects \$1.3B of value for Alpine High given today’s outperformance.”³⁶
- **Cowen (9/7/2016):** “APA announced the new Alpine High rich gas (~1300 BTU) play in the S Delaware. The wells have strong economics compared to APA’s current US portfolio This play adds ~\$3/sh to our NAV since we were already including some value for S Delaware.”³⁷
- **Credit Suisse (9/7/2016):** “Raising Target Price \$4/sh: Clearly the addition of the Alpine High resource is large and extends APA’s drilling inventory. ... There is further upward bias for the Alpine High over time.”³⁸
- **Deutsche Bank (9/7/2016):** “APA announced discovery of the Alpine High play in southern Reeves Co across 307,000 contiguous net acres (~70% of APA’s Del footprint) enhancing visibility into long-term onshore resource life (with the Woodford/Barnett pay zones to support 6 rigs over 20+ yrs). We see the discovery providing an incremental \$4/sh of risked resource value to our NAV (ex BS/Wolfcamp) with upside from further delineation activities.”³⁹

³⁴ *Associated Press*, “Apache may have struck big in West Texas,” September 7, 2016, 6:29 PM (emphasis added).

³⁵ *Bloomberg First Word*, “APACHE STREET WRAP: New Play Adds ‘Fuel to the Bullish Fire,’” September 7, 2016, 9:50 AM (emphasis added).

³⁶ BMO Capital Markets, “Apache, High on the Alpine,” September 7, 2016, 7:39 PM (emphasis added).

³⁷ Cowen and Company, “Apache Corporation, Alpine High,” September 7, 2018.

³⁸ Credit Suisse, “Apache Corp., Unveils New, Large Wet Gas Play in Texas, Drills Better Wells in Midland,” September 7, 2016.

³⁹ Deutsche Bank, “Apache Corp., Addressing Onshore Resource Depth,” September 7, 2016.

- **Dow Jones Institutional News (9/7/2016):** “Shares of Apache (APA) are soaring today after the oil & gas driller announced a major oil find in the Delaware basin. ... Shares of Apache have jumped 8.6% to \$56.12 at 10:12 a.m. today, while the Energy Select Sector SPDR ETF (XLE) has advanced 0.5% to \$70.44.”⁴⁰
- **Morgan Stanley (9/7/2016):** “APA announces 2-3k potential locations in early stage wet gas play: Alpine High in Delaware basin. The discovery improves APA’s inventory depth and informs a key debate concerning depth and quality of its Permian position. We add \$5/sh to our NAV and recognize a wide range of potential outcomes. ... Raising our price target to \$63 from \$61 to reflect the NAV accretion from Alpine High.”⁴¹
- **Reuters (9/7/2016):** “Apache’s shares spiked as much as 14 percent to \$58.99 in early trading after the company said it had assembled contiguous parcels of more than 300,000 acres for \$1,300 an acre in the field it calls ‘Alpine High,’ most of which is in Reeves County, Texas.”⁴²
- **RBC (9/7/2016):** “Management has drawn a comparison with Alpine High to the wet Marcellus, condensate Eagleford, and SCOOP plays. However, the company thinks Alpine High is advantaged with better geology including lower clay content, higher porosity, and greater thickness. ... We expect this announcement to generate a significant amount of investor interest. For APA it has the potential to be a major long-term growth development.”⁴³
- **Seaport Global (9/7/2016):** “Takeaway: The Permian unveiling we’ve been waiting for. Since this spring, we’ve been anticipating a larger Permian unveiling in which APA announces the results of its wildcatting activity in SW Reeves Co. and defines its core Midland and Delaware acreage (link to our prior note). While the scope of APA’s core acreage in the Midland (~193K net acres) and Delaware (~12K net acres in its focus areas) are on par with our previous expectations, the scale and associated economics of its Alpine High discovery (primarily located in SW Reeves Co.) comes as a

⁴⁰ Dow Jones Institutional News, “Apache: Now That’s an Gusher! -- Barron’s Blog,” September 7, 2016, 10:15 AM (emphasis added).

⁴¹ Morgan Stanley, “Apache Corp., Resource Response in Alpine High,” September 7, 2016, 11:48 PM.

⁴² Reuters, “UPDATE 2-A resilient Apache Corp strikes oil in overlooked Texas field,” September 7, 2016, 11:56 AM (emphasis added).

⁴³ RBC Capital Markets, “APA - New Permian Resource Play Dubbed ‘Alpine High’,” September 7, 2016, 8:47 AM (emphasis added).

surprise – while it’s still early innings (only ~19 wells drilled to date), APA’s preliminary look at Alpine High economics look encouraging.”⁴⁴

- ***TheFlyontheWall.com* (9/7/2016):** “Apache gaps and runs higher on new resource play in Southern Delaware basin.”⁴⁵
- ***The Times* (9/7/2016):** “News of the field, in an area that had been largely ignored by geologists, sent shares in Apache soaring by 13 per cent yesterday.”⁴⁶
- **Simmons & Company (9/7/2016):** “APA out with big news this morning as the company announced a new play in the Southern Delaware Basin called the Alpine High (located on the southwestern side of Reeves county).”⁴⁷
- **UBS (9/7/2016):** “APA announced the *discovery of a significant new resource play (the ‘Alpine High’)* in the southern Delaware Basin (primarily in southwest Reeves County) where it has accumulated 307,000 net acres over the course of 2015-16 for ~\$1,300/net acre. ... We’ve raised our NAV by ~\$13/share to \$53.70/share. Roughly ~\$10/share of our NAV increase is attributed to the new Alpine High play.”⁴⁸
- **Wells Fargo (9/7/2016):** “Big discovery announced by APA this morning known as Alpine High in Southern Reeves where the Company has accumulated 307K net contiguous acres. Lots of speculation around the play potential, but we see this providing significant upside potential to shares from a NAV perspective. Granted the details are somewhat limited at this stage, but our first take is positive given greater Permian resource inventory, more visibility on a production ramp into 2017, and emerging credibility for the management team. ... Based on the current strip, we shake out around \$2.5MM PV-10 per well which based on the 2,000-3,000+ location range implies \$8-\$13 per share upside potential.”⁴⁹

⁴⁴ Seaport Global, “SGS Dirty Energy Daily,” September 7, 2016.

⁴⁵ *TheFlyontheWall.com*, “Apache gaps and runs higher on new resource play in Southern Delaware basin,” September 7, 2016, 9:36 AM.

⁴⁶ *The Times*, “Apache’s black gold in Texas,” September 7, 2016, 8:01 PM (emphasis added).

⁴⁷ Simmons & Company, Energy Specialist of Piper Jaffray, “Apache Corporation, Announces New Delaware Basin Play,” September 7, 2016.

⁴⁸ UBS, “Apache Corporation, Unveils New Gassy Play in the Southern Delaware Basin & Increases 2016 Capex; Raising 2P NAV,” September 7, 2016 (emphasis added).

⁴⁹ Wells Fargo, “Apache Corporation, APA: Thoughts On Alpine High Discovery,” September 7, 2016.

- **ACCESSWIRE (9/8/2016):** “Investors welcomed the news of the new discovery and this sentiment positively impacted the company’s shares. The company’s stock price jumped 6.70%, closing the trading session at \$55.13. A total volume of 14.58 million shares exchanged hands by the end of the day, which was higher than the three months average volume of 2.90 million shares.”⁵⁰
- **Credit Suisse (9/8/2016):** “The key point inside [about Alpine High] is that the low clay content and excellent porosity is why the rocks are so productive in a lower pressure and hence lower cost environment - which in turn is why the economics look so compelling. We ran the lower pressure type curve yesterday in our model with a more conservative cost per well to derive our \$4/sh uplift.”⁵¹
- **Houston Chronicle (9/8/2016):** “Apache said it believes it can get more out of Alpine High, and so did investors: Shares of Apache rose nearly 7 percent, or \$3.46, to close at \$55.13 Wednesday.”⁵²
- **Investor’s Business Daily (9/8/2016):** “[A]fter rising nearly 7% Wednesday, oil and gas producer Apache (NYSE:APA) tacked on another 7% after the company announced a significant discovery in a Texas shale formation *that could hold up to three billion barrels of oil and 75 trillion cubic feet of natural gas*.”⁵³
- **RBC (9/8/2016):** “We have increased our price target by \$2/share to \$62. Our new \$65 NAV now includes a bit over \$5/share for Alpine High but it could be worth \$10-15+/share over time if the play proves to be successful over a large portion of the acreage.”⁵⁴
- **SNL Energy Finance Daily (9/8/2016):** “Apache Corp. rose 6.70% in heavy trading to settle at \$55.13 at market close on Wednesday, Sept. 7, after saying

⁵⁰ ACCESSWIRE, “Blog Coverage Apache Hits the Biggest Oil Discovery in Southern Delaware Basin,” September 8, 2016 (emphasis added).

⁵¹ Credit Suisse, “Apache Corp., Alpine High Has Potential To Be A World Class Resource,” September 8, 2016.

⁵² Houston Chronicle, “Apache said it believes it can get more out of Alpine High, and so did investors: Shares of Apache rose nearly 7 percent, or \$3.46, to close at \$55.13 Wednesday,” September 8, 2016 (emphasis added).

⁵³ Investor’s Business Daily, “Stocks End Lower As Oil Rallies 5%; Apache Soars 14% In Two Sessions,” September 8, 2016 (emphasis added).

⁵⁴ RBC Capital Markets, “Apache Corporation, Lofty Prospects for Alpine High,” September 8, 2016, 10:11 AM.

that it found a *significant new resource play holding more than 75 Tcf of natural gas and 3 billion barrels of oil.*⁵⁵

- **Societe Generale (9/8/2016):** “John Chistmann and team have been at the helm 20 months, but they’ve executed a dramatic strategic corporate transformation in order to create long-term value. **The market reacted positively to the Alpine High** yesterday.”⁵⁶
- **The Oil Daily (9/8/2016):** “Apache’s shares caught a tailwind on Wednesday as the company announced the discovery of a ‘*significant new resource play*’ in a largely overlooked area of the red-hot Permian Basin.”⁵⁷
- **Seeking Alpha (9/8/2016):** “After surging nearly 7% yesterday, Apache (NYSE:APA) added another 7% in today’s trade following news of its major discovery in an overlooked corner of west Texas’ Delaware Basin that *could hold up to 3B barrels of oil and 75T cf of natural gas.*”⁵⁸
- **Houston Chronicle (9/9/2016):** “**Shares of Apache rose for the second straight day** following the company’s [Alpine High] announcement, or 14 percent in total.”⁵⁹
- **Omaha World-Herald (9/9/2016):** “Now [Alpine High] is reckoned by Apache - whose **shares rose as much as 13 percent Wednesday and were up an additional 7 percent Thursday** - to be worth anywhere from \$8 billion to \$80 billion, depending on actual drilling and production results.”⁶⁰
- **MarketWatch (9/10/2016):** “**Apache Corp. stock is among the top gainers this week** after the energy company revealed an ‘*immense*’ oil and gas reserve in a relatively unknown corner of west Texas. ... When Apache announced the discovery on Wednesday, the stock rose more than 7%. Weekly gains

⁵⁵ SNL Energy Finance Daily, “Wednesday’s Energy Stocks: Apache surges on major oil, gas find; Duke dips on Norway’s fund exclusion,” September 8, 2016 (emphasis added).

⁵⁶ Societe Generale, “Apache Corp, An organic, low cost, 15.5 BBOE Delaware resource capture could cause Street sentiment to change,” September 8, 2016, 12:09 AM (emphasis added).

⁵⁷ The Oil Daily, “Apache Touts New Delaware Basin Resource Play,” September 8, 2016 (emphasis added).

⁵⁸ Seeking Alpha, “Apache +15% in two days after ‘game-changer’ oil discovery,” September 8, 2016, 6:22 PM (emphasis added).

⁵⁹ Houston Chronicle, “West Texas discovery puts Apache back in game; Strategy of aggressive exploration goes against grain, analysts say,” September 9, 2016 (emphasis added).

⁶⁰ Omaha World-Herald, “Profits from Texas oil find could extend to Omaha; Northern Natural Gas has the pipelines, but railroads may benefit, too,” September 9, 2016 (emphasis added).

reached more than 14% on Friday, the stock's best weekly rise since mid March.”⁶¹

14. Thus, the undisputed economic evidence presented here, and in the following subsections, is strongly supportive of Plaintiffs’ allegations of positive “front-end” price impact as of the first day of the Class Period, which caused Apache’s common stock to trade at artificially inflated prices throughout the entire Class Period, until “the facts misrepresented and concealed by Defendants’ prior materially false or misleading statements gradually became apparent to the market, [and] the price of Apache common stock fell precipitously, as the prior artificial inflation created and/or maintained by Defendants’ materially false or misleading statements dissipated” through each of the five alleged corrective disclosures.⁶²

V. Ms. Allen Has Adopted an Incorrect and Overly Narrow Interpretation of Lead Plaintiffs’ Allegations in This Matter

15. Ms. Allen’s opinion that “there is no price impact and no link between any of the alleged misrepresentations made during the alleged Class Period and Apache’s stock price during the Focus Period,”⁶³ hinges on her faulty assumption that the “alleged ‘truth’ regarding the alleged misrepresentations”⁶⁴ could only have been revealed by the disclosure of information sufficient to “change the market’s expectations about Alpine High’s reserves or the mix of oil and wet gas vs. dry gas.”⁶⁵ Additionally, Ms. Allen’s “big picture” analysis in Section VIII of her Report implicitly and mistakenly assumes that “downward changes in expectations about Alpine High,”

⁶¹ *MarketWatch*, “See where Apache Corp. says it found billions of barrels of oil; A sleepy corner of west Texas is home to an ‘immense’ discovery,” September 10, 2016, 10:54 AM (emphasis added).

⁶² Complaint, ¶301.

⁶³ Allen Report, ¶3.

⁶⁴ Allen Report, ¶46.

⁶⁵ Allen Report, ¶48(c); *see also id.* ¶¶73, 80, 97–102.

“driven by the deteriorating outlook for commodity prices,” are unrelated to Defendants’ alleged fraud.⁶⁶

16. These opinions, however, are premised on an incorrect and overly narrow interpretation of Plaintiffs’ claims. Specifically, Ms. Allen ignores Plaintiffs’ allegations that, “[i]n addition to touting the putatively extraordinary volume of high quality oil and NGLs across the Alpine High acreage,”⁶⁷ Defendants also repeatedly and misleadingly reassured investors that Alpine High was a “transformational discovery” for Apache and a “world class resource play” that, among other things, would prove to be “highly economic” and “drive incremental growth and returns for years to come,” including “*even if* oil or gas prices fell substantially.”⁶⁸ Throughout the Class Period, Defendants’ alleged misstatements repeatedly underscored these topics—including reassurances that continued even until close to the end of Ms. Allen’s Focus Period.

17. For instance, the Complaint alleges that:

- In Apache’s September 7, 2016 press release, “Defendant Christmann hailed the Alpine High discovery as ‘an immense resource that we believe will deliver significant value for our shareholders for many years.’”⁶⁹ And, during the Barclays conference the same day, “Defendants touted Alpine High as a ‘world-class resource play,’” and “Christmann represented to investors that the play would produce highly profitable results in oil and wet gas even at very low commodity prices.” Indeed, Christmann explained that, after factoring all possible costs (“fully burdened” economics), “the rates of return...go off the charts”—and that even at \$40/barrel oil and \$2.50 gas, “the returns are still significantly high,” which “just gets back to how prolific [Alpine High] is.” Christmann stated that these “tremendous economics” made for a play where there was a “very wet gas resource where you virtually get the [dry] gas for free.”⁷⁰ Finally, Christmann warranted

⁶⁶ Allen Report, ¶6.

⁶⁷ Complaint, ¶36 (emphasis added).

⁶⁸ Complaint, ¶¶1 (emphasis in original removed), 36 (emphasis in original), 208.

⁶⁹ Complaint, ¶191 (emphasis added).

⁷⁰ Complaint, ¶¶192, 194 (emphasis in original removed, emphasis added).

that Alpine High “**was always in the oil and wet gas window. It’s not dry gas.**”⁷¹

- “On September 28, 2016, *Forbes* published an article titled ‘Apache Corp. Represents The Thorn That America’s Oil Frackers Have Stuck In The Side Of OPEC.’ The article noted that ‘Christmann says the field, which they named Alpine High, **contains some of the cheapest oil and gas to produce not just in the U.S., but in the world, economic to drill at prices as low as \$40 a barrel,**’ and quoted Christmann as saying that ‘**Alpine High will be very difficult to compete with on an economic basis.**’”⁷²
- On February 23, 2017, Apache issued a press release quoting Christmann as stating: “We [] discovered and announced the Alpine High, a sizeable new resource play in the Delaware Basin, which **brings significant drilling inventory and puts Apache in one of the most exciting and competitive positions in the industry.**”⁷³ And, during Apache’s investor conference call the same day, Christmann reaffirmed that “**even in the lower commodity price environment, this play is going to be very economic.**”⁷⁴
- On October 9, 2017, Defendant Sullivan again touted Alpine High’s numerous oil drilling locations, stating that, in the Wolfcamp and Bone Springs formations, “[Apache] can safely say that we have at least **500 economic [oil] well locations** at this time.”⁷⁵
- On February 22, 2018, Defendants reiterated: “[A]t Alpine High, we are **building out a world-class resource play that will change the course of Apache. The expanse of the opportunity in terms of acreage and hydrocarbon column will drive capital investment, and very soon, free cash flow for decades to come.**”⁷⁶ Furthermore, Defendants again reassured investors that Alpine High would be profitable and successful even at extremely low commodity prices, stating Alpine High “**is going to really hum below \$2 [prices] on the gas side**” and that “we’ve run many cases on the downside. **We would not be making this type of investment on the midstream or the upstream side if we thought there was a sensitivity that**

⁷¹ Complaint, ¶199 (emphasis added).

⁷² Complaint, ¶206 (emphasis in original removed, emphasis added).

⁷³ Complaint, ¶223 (emphasis in original removed, emphasis added).

⁷⁴ Complaint, ¶224 (emphasis in original removed, emphasis added).

⁷⁵ Complaint, ¶248 (emphasis in original removed, emphasis added).

⁷⁶ Complaint, ¶254 (emphasis in original removed, emphasis added).

was close to anything that would come into making it not work under very, very low gas and NGL and oil prices.⁷⁷

- On May 2, 2019, even after Apache's April 23, 2019 announcement of gas deferral at Alpine High purportedly due to low commodity prices, Christmann promised that Alpine High would be significantly increasing the Company's profitability in the near future, stating: "In the Permian, **we are poised to deliver attractive oil growth and a substantial cash flow uplift at Alpine High in the second half of the year.**"⁷⁸
- On May 15, 2019, Bloomberg published a story titled, "Apache bets big on Permian gas liquids." An Apache corporate spokesperson was quoted in the article as stating "**Investors do not yet have an appreciation for the potential cash flow generation from the liquids play at Alpine High.**"⁷⁹
- On August 1, 2019, Apache issued a press release announcing the Company's financial results for the second quarter of 2019. The press release noted that Alpine High's production had been disappointing, purportedly due to "delays" in bringing wells online, but assured investors that this was a temporary situation and things would soon improve. Specifically, Defendant Christmann was quoted as saying: "**We will catch up in the second half of 2019 and exit the year with oil production on plan and with strong momentum heading into 2020.**" During the accompanying investor conference call, Defendant Christmann continued to tout Alpine High, stating "we like the asset. **It's a large resource as we've proven. There is tremendous rich-gas potential.**"⁸⁰

18. Thus, by overlooking numerous alleged misstatements, misconstruing Plaintiffs' theory of liability, and interpreting the Complaint's allegations through an overly narrow lens, Ms. Allen fails to consider whether the alleged corrective events caused investors to change their view regarding the economics of the Alpine High play, including with respect to oil, wet gas/NGLs, and dry gas, and particularly in a low-price environment for those commodities. However, in light of Defendants' prior reassurances of highly compelling economics even at

⁷⁷ Complaint, ¶256 (emphasis in original removed, emphasis added).

⁷⁸ Complaint, ¶273 (emphasis in original removed, emphasis added).

⁷⁹ Complaint, ¶275 (emphasis in original).

⁸⁰ Complaint, ¶¶278–79 (emphasis in original removed, emphasis added).

extremely low commodity prices, changes in the market's expectations regarding Alpine High's profitability in a low-price environment are entirely consistent with Plaintiffs' theory of liability, as are any resulting economic losses. The same is true of Ms. Allen's assertion that "movements in Apache's stock price and changes in expectations about Alpine High during the Focus Period were ... due to changes in commodity prices during the Focus Period."⁸¹ The revelation of Alpine High's poor performance when faced with low commodity prices is in direct contrast to Defendants' allegedly false assurances during the Class Period that Alpine High would continue to perform well—"really hum," in Defendant Christmann's February 22, 2018 words—even at very low commodity prices.

VI. Ms. Allen Fails to Demonstrate a Lack of Price Impact Associated With the April 23, 2019 Alleged Corrective Disclosure

19. Before market open on April 23, 2019, Apache issued a press release announcing that the Company had "initiated natural gas production volume deferrals from its Alpine High play in late March, in response to extremely low prices at Waha Hub." According to the Company, the "deferrals represent[ed] approximately 250 million cubic feet (MMcf) per day of gross gas production."⁸² Defendant Christmann made the following remarks:

"We anticipate relatively wide and volatile natural gas price differentials in the Permian Basin until the Gulf Coast Express pipeline enters service. As a long-term returns-focused company, we know that production deferrals such as this will improve financial performance despite the impact on near-term volumes. This is the proper approach from both an environmental and economic perspective relative to other industry practices such as flaring or selling associated gas at a negative or unprofitable price," continued Christmann.

"We will closely monitor daily pricing and return our gas to sales when it is profitable to do so. We are carefully managing these actions so there is no adverse impact on long-term wellbore integrity or reservoir productivity and look

⁸¹ Allen Report, ¶6.

⁸² *GlobeNewswire*, "Apache Corporation Announces Temporary Deferral of Alpine High Natural Gas Production in Response to Recent Pricing at Waha Hub," April 23, 2019, 6:30 AM.

forward to returning this production to market as soon as practical,” said Christmann.⁸³

Plaintiffs allege that “[a]s a direct result of the April 23, 2019 partial corrective disclosure that the Company was scaling back natural gas production efforts,” Apache’s stock price declined from a close of \$37.09 on April 22, 2019 to a close of \$33.06 on April 26, 2019, “a four-day decline of \$4.03 per share, or nearly 11%.”⁸⁴

20. Apache’s announcement of a deferral at Alpine High was not made in connection with any other announcements or earnings release by the Company, and Ms. Allen has not identified any other Company-specific news to explain the statistically significant price decline in Apache common stock from April 23–26, 2019. Nonetheless, she concludes that there is no price impact associated with the April 23, 2019 alleged corrective disclosure for the following three reasons:

- “there was no statistically significant decline in Apache’s stock price following the April 23, 2019 press release, according to both Dr. Nye’s event study model and the alternative event study model”;
- “the allegedly corrective information, the deferral of gas production at Alpine High, was in response to ‘extremely low’ regional gas prices and was expected by the market given those prices”; and
- “the allegedly corrective information did not change the market’s expectations about Alpine High’s reserves or the mix of oil and wet gas vs. dry gas.”⁸⁵

21. First, as discussed in Section X below, Ms. Allen’s conclusion that the April 23, 2019 partial corrective disclosure had no price impact because it did not induce a statistically significant single-day stock price decline at the 95% confidence level is a fundamental error of statistical inference. The science of financial economics explicitly allows for security prices to

⁸³ *Ibid.*

⁸⁴ Complaint, ¶311.

⁸⁵ Allen Report, ¶48.

efficiently adjust to new information that even minimally affects the “present value of the expected cash flows an investor will receive from owning it,”⁸⁶ and “the absence of a statistically significant price adjustment does not show the stock price was unaffected by the misrepresentation.”⁸⁷

22. Second, Ms. Allen’s opinion is also premised on the assumption that a one-day event window is the only appropriate event window to use when assessing price impact for the April 23, 2019 disclosure. On the contrary, as discussed in Section XI below, it is well established that the use of a multi-day event window is a reliable and scientific methodology for estimating the price impact of certain corporate events. In fact, Ms. Allen has used multi-day event windows in her prior expert work. For instance, in *Beckel v. Fagron Holdings USA, LLC*, a securities fraud case involving “a claim for damages against Defendants for violation of Section 10(b),”⁸⁸ Ms. Allen herself used a three-day stock price reaction following an alleged corrective disclosure to calculate plaintiff’s damages.⁸⁹

⁸⁶ Berk, Jonathan and Peter DeMarzo, 2007, *Corporate Finance*, Pearson Education, Inc., 1st Ed., Ch. 9, p. 245.

⁸⁷ *Rooney v. EZCORP, Inc.*, 330 F.R.D. 439, 450 (W.D. Tex. 2019).

⁸⁸ *Beckel v. Fagron Holdings USA, LLC*, No. 8:16-cv-02059-SDM-AAS (M.D. Fla.) (“*Beckel*”), Amended Complaint, filed October 31, 2018, *Beckel* Dkt. 83, ¶59.

⁸⁹ *See Beckel*, Dkt. 144-2, Expert Report of Lucy P. Allen, filed April 5, 2019 (“*Allen Beckel Report*”), ¶¶22–26 (emphasis added):

To obtain as estimate of the price reaction due to the announcement of the reimbursement changes, I used the event study methodology. ... According to the event study model, there was a statistically significant decline in Fagron’s stock price on August 4, 2015. The statistically significant price reaction following the August 4 announcement **continued for two additional days**, until August 6, 2015. In total, the price decline through August 6 based on the event study was 26.5%. ... Using the 26.5% stock price decline based on the event study yields damages of \$2.68 million (\$10.11 million × 26.5% = \$2.68 million).

23. Here, however, Ms. Allen ignores the statistically significant multi-day price declines observed following the April 23, 2019 partial corrective disclosure. Specifically, as shown in the following table, the two-, three- and four-day declines in Apache's stock price are statistically significant at the 92.59%, 98.96% and 99.01% confidence levels, respectively, under my event study model (which Ms. Allen does not contest), while the three- and four-day stock price declines are likewise statistically significant at the 94.33% and 96.56% confidence levels, respectively, under Ms. Allen's alternative event study model:

Event Window	Nye Event Study			Allen Alternative Event Study		
	Company-Specific Return	t-Stat	Confidence Level	Company-Specific Return	t-Stat	Confidence Level
4/23/2019	-1.45%	-1.05	70.64%	-1.37%	-0.99	67.77%
4/24/2019	-2.04%	-1.48	86.06%	-0.75%	-0.54	41.28%
4/25/2019	-2.67%	-1.94	94.62%	-2.47%	-1.78	92.38%
4/26/2019	-1.01%	-0.73	53.29%	-1.31%	-0.94	65.11%
2-Day Event Window (4/23-24/2019)	-3.49%	-1.79	92.58%	-2.13%	-1.09	72.12%
3-Day Event Window (4/23-25/2019)	-6.16%	-2.58	98.96%	-4.60%	-1.91	94.33%
4-Day Event Window (4/23-26/2019)	-7.17%	-2.60	99.01%	-5.91%	-2.13	96.56%

Source: Nye Report Exhibit 11; NERA_019129

24. With respect to Ms. Allen's opinion that the April 23, 2019 partial corrective disclosure lacked price impact because the Company's deferral of gas production was "expected by the market,"⁹⁰ she implicitly assumes that the deferral was expected with 100% certainty at the time, and therefore could not possibly have had any effect on Apache's stock price.⁹¹ In doing so, however, Ms. Allen ignores the fact that at least eight analysts (Capital One; Macquarie; RBC;

While *Beckel* concerned a multi-day event window where the stock price decline on the first day was statistically significant, Ms. Allen cites no academic literature supporting the notion that multi-day event windows can only be appropriate if there is a statistically significant price decline on day 1, irrespective of stock price declines and relevant circumstances associated with the other days in the event window.

⁹⁰ Allen Report, ¶48.

⁹¹ See Allen Deposition, 133:15–20 ("[T]he market was not negatively surprised when Apache deferred its production at Alpine High. They thought -- the market was not surprised. There's no negative surprise from that. That was expected by the market. So the misstatements were not impacting the stock price.")

Scotia; Stephens; Barclays; Mizuho; and Tudor Pickering Holt & Co) issued reports and/or provided commentary to the press directly in response to the Company's announcement.⁹² Given Ms. Allen's opinion that "[a]nalysts typically issue reports after new information about the company is released,"⁹³ this fact alone strongly suggests that the deferral was "new information" to these analysts, who, in Ms. Allen's words, "play an important role in disseminating information about a stock and can be a valuable source of information on market knowledge and sentiment at the time."⁹⁴

25. Furthermore, the substance of these reports also contradicts Ms. Allen's conclusion that the deferral was fully expected by the market. Specifically, three analysts (*i.e.*, Capital One, Cowen, and Barclays) lowered their production estimates for Alpine High within days of the Company's disclosure:

- **Capital One (4/23/2019):**
Apache deferring some natural gas production at its Alpine High project is seen as having a minimal impact on Capital One's cash flow per share estimate, analyst Richard Tullis (equal-weight, PT \$29) writes in note. Assuming the current 250MMcf/d gross production remains offline for all of 2Q19, **Capital One's 2Q production estimate declines by 7% to 444Mboe/d, and CFPS estimate drops to \$1.89 from \$1.94.**⁹⁵

⁹² See *Bloomberg First Word*, "Apache Gas Deferral to Have Minimal 2Q CFPS Impact: Capital One," April 23, 2019, 9:01 AM; Macquarie Research, "Apache Corp (APA US); Effects of Negative Waha Prices, April 23, 2019; RBC Capital Markets, "APA - Deferring Alpine High Natural Gas due to Poor Pricing," April 23, 2019; Scotia Howard Weil, "Apache Corporation, Alpine High Natural Gas Production Deferred Due to Pricing," April 23, 2019; Stephens, "Apache Corporation, First Look: APA Announces Temporary Deferral of Alpine High Gas Volumes," April 23, 2019; Barclays, "Apache Corporation, Estimated Alpine High Base Production Breakevens Now vs. Ye'19; Model Update For Deferrals," April 28, 2019; *SNL Financial Extra*, "Apache cites poor Waha prices for decision to cut Permian gas production," April 23, 2019.

⁹³ Allen Report, ¶22 (emphasis added).

⁹⁴ Allen Report, ¶22.

⁹⁵ *Bloomberg First Word*, "Apache Gas Deferral to Have Minimal 2Q CFPS Impact: Capital One," April 23, 2019 (emphasis added).

- **Cowen (4/26/2019):**
Many investors appeared poised for disappointing 1Q prints out of the Permian. To date, we've already seen Waha regional gas pricing (\$1.428/Mcf in 1Q19, -\$0.29 in 2Q19) compel shut-ins at Alpine High for APA.... [In this report, **Cowen reduced its estimate of Apache's "Total Production" in 2019 to 477 Mboe/d from 490 Mboe/d.**]⁹⁶
- **Barclays (4/28/2019):**
Model Update: Based on our current dry gas breakeven of \$0.89/MCF and the Waha futures curve ..., we model half of the deferred 250MMCF/d (gross) will return in July. The Alpine High shut-ins have a minimal effect on total production. **Our Q2'19 total production estimate is now ~2% lower than our prior forecast and is now 2% lower than Consensus as well.** Reiterate Underweight rating and \$30 PT.⁹⁷

26. Ms. Allen also fails to explain how the reactions of Macquarie Research and RBC Capital Markets on April 23, 2019, both of which characterized the deferral as a "negative" event, are consistent with the notion that the announcement was expected by the market:

- **Macquarie Research (4/23/2019):**
APA announced the deferral of Alpine High dry gas production.

Impact
Slight Negative - Given the severity of local Permian natural gas pricing weakness, we think the deferral of gas is prudent and likely expected by investors. We do, however, think the announcement **confirms incremental risk is present in the back-half '19 ramp and creates additional questions on NGL pricing/volumes.** ...

Macquarie Thoughts: Even if gas is only deferred during April, we could witness 83Mmc/d, or ~14mboe/d, lower production during 2Q19, which creates a difficult ramp to >100mboe/d. We do think **the announcement places downside risk to our production estimates.** However, the announcement itself is not that much of a negative, in our view. Our greater concern is on the risk that prices remain suppressed and thus volume remains deferred for a longer period of time (i.e. multiple months). In addition to the challenge in ramping production, **we question whether the company would**

⁹⁶ Cowen, "Industry Update, 1Q19 Preview: Keeping One's Vows," April 26, 2019.

⁹⁷ Barclays, "Apache Corporation, Estimated Alpine High Base Production Breakevens Now vs. Ye'19; Model Update For Deferrals," April 28, 2019 (emphasis added).

witness any damage to the reservoir associated with the curtailed volumes.⁹⁸

- **RBC Capital Markets (4/23/2019):**

Our View: We think this is a slight negative on the margin. The decision positively impacts cash flow in the near term but it does show the current tightness and sensitivity of the Permian gas market. APA has 500 MMcf/d of capacity on Gulf Coast Express (expected in service later this year) and additional capacity on Permian Express (expected in service in 2020) providing transport to Gulf Coast markets.⁹⁹

27. Analysts with Mizuho and Tudor Pickering Holt & Co. also expressed concerns that day, following the Company's disclosure of the deferral:

Record negative prices at the Waha Hub led one of the primary independents operating in the Permian Basin to significantly cut its natural gas production.

...

With Waha prices still well into the negatives, Apache's deferrals could stay in place for some time as the company waits for the new pipeline capacity to come online. If that occurs, some analysts believe that it could sting Apache subsidiary Altus Midstream Co.'s earnings even if it has minimal effect on Apache.

"It seems like these production deferrals could remain ongoing at least until Gulf Coast Express starts up in October which likely puts the Altus EBITDA guide at some risk," Mizuho analyst Paul Sankey said.

In its commentary on Apache's move, Tudor Pickering Holt & Co. said it believes that Apache needs to go into greater detail about how the deferrals will affect its production plans for the rest of 2019.

"We'll be looking for color on volumes deferred thus far and the outlook from now through the scheduled [Gulf Coast Express] in-service date, with today's disclosure only quantifying current deferrals of ~250mmcf/d gross," the firm said. "At this point, there have been no changes to [Apache] activity plans, APA Alpine High 2019 exit production guidance, or [Altus] FY'19 EBITDA."

⁹⁸ Macquarie Research, "Apache Corp (APA US); Effects of Negative Waha Prices, April 23, 2019 (emphasis added).

⁹⁹ RBC Capital Markets, "APA - Deferring Alpine High Natural Gas due to Poor Pricing," April 23, 2019 (emphasis added).

Apache stock was down a little more than 1.4% to \$36.57 per share in early afternoon trading on the New York Stock Exchange on April 23.¹⁰⁰

28. Similarly, commentators in the financial and energy media also responded negatively to the Company's April 23, 2019 disclosure of deferrals at Alpine High. For example, *Bloomberg* reported that "the production deferral is another blow to the Apache project," while *SNL Energy Finance Daily* attributed the decline in the Company's stock price to news of the deferral:

The production deferral is **another blow to the Apache project**. The company once said Alpine High held 3 billion barrels of oil, but in March it said it was deferring oil-focused work in order to concentrate on cost reductions and producing gas and byproducts such as propane. Apache said in February it would cut its capital expenditure by 22 percent, one of the largest spending reductions in the U.S. oil and gas sector.¹⁰¹

Shares of Apache Corp. slid 1.78% on above-average volume to \$36.43, after the company declared that it initiated gas volume production deferrals from its Alpine High play in late March, with current deferrals at 250 MMcf/d of production. The company blamed the need for the deferrals on "extremely low prices" at the Waha Hub.¹⁰²

29. Furthermore, with respect to the two analysts Ms. Allen cites in support of the notion that "the deferral of Alpine High production ... was not a surprise to the market,"¹⁰³ she fails to mention: (i) that "optically [Stephens] view[ed] the release as a negative," and felt that "incremental details are needed to fully quantify the impact [of the deferral]";¹⁰⁴ and (ii) Scotiabank's conclusion that, "[u]ltimately, while the extremely low gas price environment may

¹⁰⁰ *SNL Financial Extra*, "Apache cites poor Waha prices for decision to cut Permian gas production," April 23, 2019 (emphasis added).

¹⁰¹ *Bloomberg News*, "Apache Defers Alpine High Gas Output Amid Permian Price Slump," April 23, 2019, 7:04 AM.

¹⁰² *SNL Energy Finance Daily*, "Tuesday's Energy Stocks: S&P 500 records new closing high," April 24, 2019.

¹⁰³ Allen Report, ¶56.

¹⁰⁴ Stephens, "Apache Corporation, First Look: APA Announces Temporary Deferral of Alpine High Gas Volumes," April 23, 2019.

be somewhat transitory, we see the wide and volatile WAHA differentials as a reason to avoid APA in the near term.”¹⁰⁵ Contrary to Ms. Allen’s assertion, the negative reactions of these analysts does not support an inference that the Company’s April 23, 2019 disclosure of deferrals at Alpine High was “fully expected” by the market, as Ms. Allen testified.¹⁰⁶

30. Ms. Allen also fails to consider that several analysts “update[d] [their] estimates to reflect production curtailments at Alpine High,”¹⁰⁷ following Apache’s 1Q19 earnings release a week later, on May 1, 2019, and/or commented that the Company’s production guidance missed expectations as a result of the Alpine High deferrals announced on April 23, 2019. For example:

- **Credit Suisse (5/2/2019):**
Other key takeaways: 1) 2Q production guidance of 459 MBoed (well below consensus/CSe of 484/488 MBoed) implies a ~9% sequential drop due to a 30% QoQ plunge in Alpine High volumes to 45-55 MBoed.¹⁰⁸
- **Piper Jaffray (5/1/2019):**
And despite an underwhelming 2Q/3Q production outlook (Permian frac holiday and gas deferrals), 2019 exit rate was reiterated Updated Alpine High Outlook In-line: Well-telegraphed gas deferrals are expected to reduce the FY19 target for Alpine High by 10 Mboe/d to a mid-pt of 77.5 Mboe/d.¹⁰⁹
- **RBC Capital Markets (5/2/2019):**
Updating estimates. We update our estimates to reflect production curtailments at Alpine High and the impact from the non-core asset sale and associated production (assumed 2Q19 close). The revised production

¹⁰⁵ Scotia Howard Weil, “Apache Corporation, Alpine High Natural Gas Production Deferred Due to Pricing,” April 23, 2019.

¹⁰⁶ Allen Deposition, 132:16–18.

¹⁰⁷ RBC Capital Markets, “Apache Corporation, The Waiting Game,” May 2, 2019, 8:42 PM.

¹⁰⁸ Credit Suisse, “Apache Corporation, Still Waiting for FCF Inflection; Trimming Ests,” May 2, 2019 (emphasis added).

¹⁰⁹ Simmons Energy, A Division of Piper Jaffray, “Apache Corporation, Q1’19 Quick Look: Solid Result, While Market Waits on Suriname,” May 1, 2019, 8:37 PM (emphasis added).

guide of 420–435 Mboe/d is lowered by 5 Mboe/d to reflect the curtailments but does not reflect the impact of the asset sale.¹¹⁰

- **Scotiabank (5/1/2019):**
[W]hile the quarter was fine, the outlook for 2Q19 is challenging with the recently announced natural gas curtailments in the Alpine High. Between Alpine High shut-ins and lower projected international volumes, total adjusted production is expected to see a sequential decline of 10%, or from 437 MBoe/d to 392 MBoe/d.¹¹¹
- **Stephens (5/2/2019):**
Company guided 2Q19 adj. volumes to 392 Mboepd vs. our ~413 Mboepd outlook. The delta in our estimate vs. guide was lower Alpine (guide of 45-55 Mboepd, ~15% below our expectations) and International volumes (~132 Mboepd guide, ~5% below our forecast).¹¹²
- **UBS (5/2/2019):**
Apache reported solid Q1 results with EBITDAX above expectations tied to int'l production. However, given (1) the production deferrals at Alpine High and current natgas / NGLs pricing, (2) exploration potential in Suriname, and (3) non-core asset divestitures (\$300mm), management commentary / outlook in these areas will command most of the market's focus. The immediate impact of the deferrals is expected in 2Q with production declining ~20mboepd at the midpoint from 1Q levels.¹¹³
- **Wolfe (5/1/2019):**
Alpine High Deferrals Quantified. After announcing last week that it would begin deferring near-term completions at Alpine High due to low Waha gas pricing, APA forecast that 2Q19 volumes in the play will average 45-55 MBOE/d, down <30% vs. 1Q19 Alpine High production of 70 MBOE/d. The >100MBOE/d has remained intact though. During the quarter APA dropped from 7 rigs/2 frac crews in the play to 5 rigs/1 crew with completions falling by 35% Q/Q, so activity here is clearly dropping.¹¹⁴

¹¹⁰ RBC Capital Markets, "Apache Corporation, The Waiting Game," May 2, 2019, 8:42 PM (emphasis added).

¹¹¹ Scotia Howard Weil, "Apache Corporation, 1Q19 Results: Quarter Overshadowed by Difficult 2Q19 Outlook," May 1, 2019, 8:04 PM (emphasis added).

¹¹² Stephens, "Apache Corporation, First Look: Solid 1Q19 Results; 2Q19 Guide," May 2, 2019 (emphasis added).

¹¹³ UBS, "Apache Corporation, Q1 Beats EBITDAX; Several Other Moving Pieces," May 2, 2019 (emphasis added).

¹¹⁴ Wolfe Research, "Apache Corp., Paramaribo Dreamin'," May 1, 2019 (emphasis added).

31. In sum, given the voluminous evidence to the contrary, Ms. Allen has no basis to opine that the April 23, 2019 partial corrective disclosure lacked price impact because the Company’s deferral of gas production was “expected by the market.”¹¹⁵ The reactions of analysts and news media strongly suggest that Apache’s announcement of gas deferrals at Alpine High was considered an unexpected negative event. Indeed, consistent with market efficiency, which dictates that stock prices change upon the disclosure of new, unexpected, value relevant information,¹¹⁶ both my and Ms. Allen’s alternative event studies find that Apache stock suffered a series of Company-specific stock price declines, net of contemporaneous market and industry effects, following the April 23, 2019 partial corrective disclosure.¹¹⁷

32. Moreover, Ms. Allen asserts that “the allegedly corrective information, the deferral of gas production at Alpine High,”¹¹⁸ “rather than having any link to the alleged misrepresentations made during the alleged Class Period,”¹¹⁹ “was in response to ‘extremely low’ regional gas prices.”¹²⁰ However, this seeks to rebut Plaintiffs’ allegations regarding “loss causation—a causal connection between the defendants’ alleged misrepresentations and the plaintiffs’ economic losses,”¹²¹ which I understand to be premature at this stage of the litigation.¹²² The

¹¹⁵ Allen Report, ¶48.

¹¹⁶ Nye Report, ¶60: “Apache’s common stock price reflected the information disclosed to the market, and promptly responded to the disclosure of new, unexpected, value relevant information.” Ms. Allen assumes, and therefore does not dispute, that Apache stock traded in an efficient market throughout the Class Period. (*See* Allen Report, ¶1.)

¹¹⁷ *Supra* at ¶23.

¹¹⁸ Allen Report, ¶48.

¹¹⁹ Allen Report, ¶53.

¹²⁰ Allen Report, ¶48.

¹²¹ *Halliburton II*, 134 S. Ct. at 2406 (internal quotations omitted).

¹²² *Erica P. John Fund, Inc. v. Halliburton Co.*, 563 U.S. 804 (2011).

same is true for her argument that the April 23, 2019 partial corrective disclosure lacked price impact because “the allegedly corrective information did not change the market’s expectations about Alpine High’s reserves or the mix of oil and wet gas vs. dry gas.”¹²³ Indeed, without the benefit of fact discovery, Ms. Allen is simply assuming that the Company’s decision to defer gas production at Alpine High was entirely unrelated to the alleged misrepresentations.¹²⁴ However, it is my understanding that these arguments are contingent on “inquiries into loss causation [that I understand] are properly addressed by a fact-finder on the merits,”¹²⁵ not by a financial economist prior to the close of fact discovery.

33. Moreover, Ms. Allen’s price impact analysis for April 23, 2019 completely ignores Plaintiffs’ allegations that Defendants falsely “assur[ed] investors that Alpine High’s best wells would ‘generate positive returns even at 0 [dry] gas price,’”¹²⁶ and “continued to assuage investor concern [throughout the Class Period] by presenting Alpine High in an overwhelmingly favorable light with highly compelling economics even at very low energy prices.”¹²⁷ Thus, under Plaintiffs’ theory of liability, it is entirely plausible that investors would react negatively (as they did) to news of gas production deferrals at Alpine High, which undermined Defendants’ prior assurances of highly compelling economics even at “‘extremely low’ regional gas prices.”¹²⁸ Contrary to Ms. Allen’s assertions, changes in the market’s expectations regarding

¹²³ Allen Report, ¶48.

¹²⁴ See Allen Deposition, 34:25–35:13 (conceding that Ms. Allen never asked Defendants’ counsel if Apache has any internal documents bearing on price impact).

¹²⁵ *Hatamian v. Advanced Micro Devices, Inc.*, No. 14-CV-00226-YGR, 2016 WL 1042502, at *9 (N.D. Cal. Mar. 16, 2016).

¹²⁶ Complaint, ¶72.

¹²⁷ Complaint, ¶78.

¹²⁸ Allen Report, ¶48.

Alpine High's profitability in a low-price environment are related to the alleged misrepresentations, as are any resulting economic losses.

VII. Ms. Allen Fails to Demonstrate a Lack of Price Impact Associated With the October 25, 2019 Alleged Corrective Disclosure

34. On October 25, 2019, early in the trading day at approximately 9:44 AM, news reports revealed that Apache's Senior Vice President of Worldwide Exploration, Steven Keenan, had resigned.¹²⁹ Roughly 35 minutes after the news broke, the market learned that Mr. Keenan's resignation was "[n]ot [r]elated to" its Suriname exploration, but rather to "other matters."¹³⁰ Apache's stock price declined following news of Mr. Keenan's resignation, and continued to trade well below its opening price even after the market learned that Mr. Keenan's resignation was unrelated to Apache's operations in Suriname, closing at \$22.07, or -4.99% from the previous day's close of \$23.23. Ms. Allen has not identified any other Company-specific news that could have influenced Apache's stock price on October 25, 2019.

35. According to my event study, the Company-specific return on October 25, 2019, as measured from the prior trading day's closing price to the closing price on October 25, 2019, was -5.55%, which is statistically significant at the 99.92% confidence level.¹³¹ Media outlets attributed the decline in the prices of Apache's securities on October 25, 2019 to the news of Mr. Keenan's resignation. For example:

- Apache reports resignation of SVP of worldwide exploration, Bloomberg reports that Apache said its Senior Vice President of Worldwide Exploration,

¹²⁹ *Bloomberg News*, "Apache: SVP of Worldwide Exploration Steven Keenan Resigned," October 25, 2019, 9:44 AM.

¹³⁰ RBC Capital Markets, "APA - SVP Resignation Causing Stock Weakness; Company Indicating Not Related to Maka-1 Outcome," October 25, 2019, 10:19 AM.

¹³¹ *See* Nye Report, Exhibit 11B.

Steven Keenan, has resigned. In early trading, shares of Apache are down 7.5% to \$21.49.¹³²

- Apache bonds weakened Friday morning in New York after a spokesman confirmed that Steven Keenan, the geologist leading one of the company's most important exploration ventures, has resigned. The spreads on the energy company's 4.375% bonds due 2028 widened 10 bps to 272 bps, according to Trace. The bonds were among the biggest losers in the U.S. investment grade market today, on a spread basis The stock fell as much as 11.45%.¹³³

36. According to Ms. Allen's alternative event study, the Company-specific return on October 25, 2019, also measured from the prior trading day's closing price to the closing price on October 25, 2019, was -7.37%, which is statistically significant at the 100.00% confidence level. Thus, Ms. Allen does not dispute that Apache's stock price decline on October 25, 2019 was statistically significant.¹³⁴ Nor does she dispute that the stock price decline was in reaction to news of Mr. Keenan's departure.¹³⁵ Instead, she argues that the "October 25, 2019 alleged corrective disclosure shows no price impact," because:

- i. "all analyst commentary following this announcement explicitly attributed Apache's stock price decline on that day to market speculation about Apache's Suriname exploration and not due to any new news about Alpine High;" and
- ii. "no new information about Alpine High was revealed."¹³⁶

37. However, Ms. Allen's analysis of the market's reaction to the October 25, 2019 corrective disclosure is inaccurate and incomplete, and therefore unreliable. Indeed, she fails to consider several relevant events that transpired over the course of the day, which invalidate her

¹³² *Theflyonthewall.com*, "09:59 EDT Apache reports resignation of SVP of worldwide exploration, Bloomberg...", October 25, 2019.

¹³³ *Bloomberg*, "Apache's Debt Weakens After Key Geologist Leaves," October 25, 2019, 12:35 PM.

¹³⁴ *See* Allen Deposition, 156:6–11.

¹³⁵ *See* Allen Deposition, 156:25–157:8.

¹³⁶ Allen Report, ¶64.

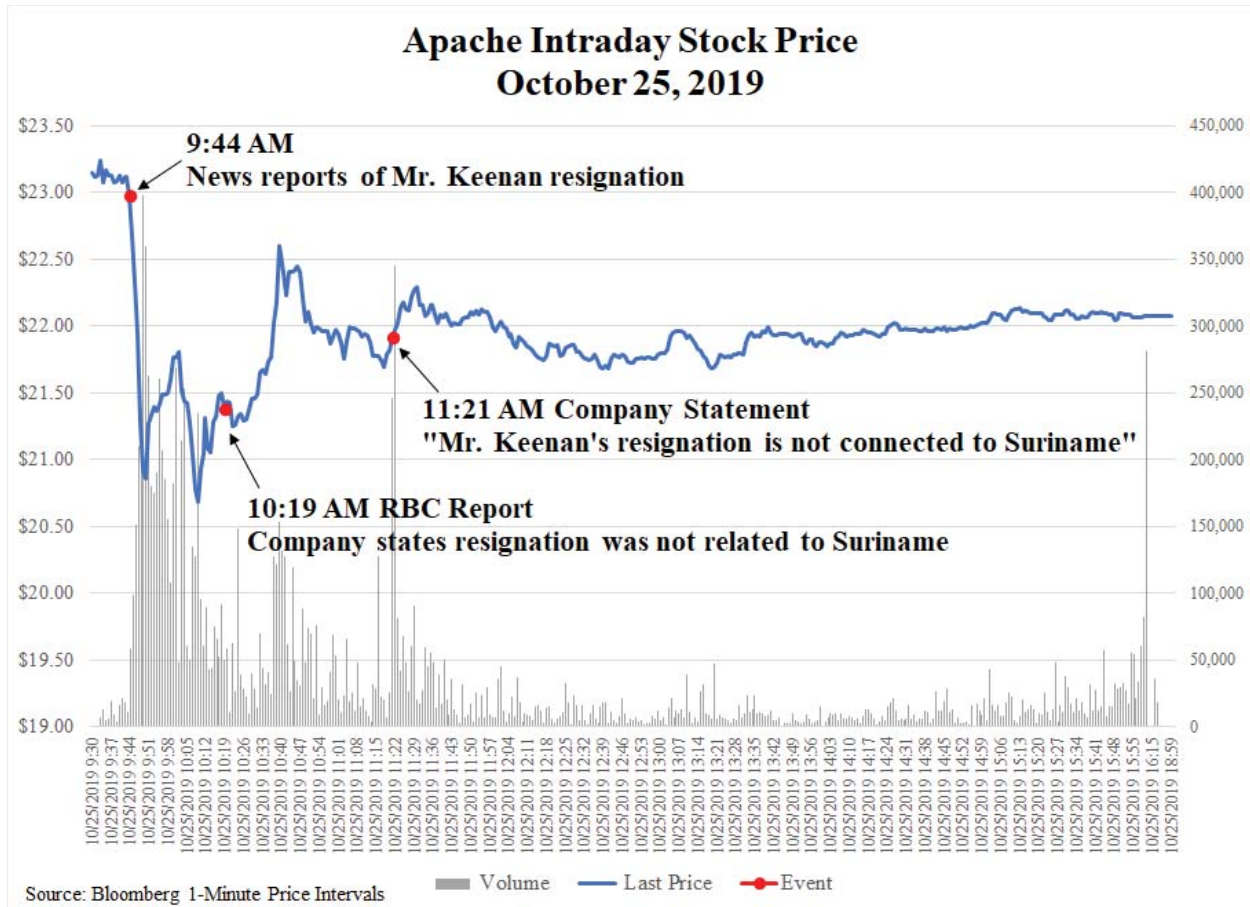
assertion that the statistically significant stock price decline that day was due to investor concerns about Suriname.¹³⁷ Specifically, Ms. Allen ignores the fact that Apache's stock price plummeted immediately after Mr. Keenan's departure was announced at 9:44 AM, but then partially rebounded roughly 35 minutes later after RBC Capital Markets reported, at 10:19 AM, that "[b]ased on our conversation with APA, as of the resignation date, the [C]ompany had not reached the target objective at the [Suriname project's] Maka-1 prospect and **[Mr. Keenan's] resignation was related to other matters.**"¹³⁸ Ms. Allen also omits any mention of Bloomberg's 11:21 AM newsflash that "***APACHE SAYS SVP KEENAN'S DEPARTURE NOT CONNECTED TO SURINAME,**"¹³⁹ after which the Company's stock price stabilized at roughly \$22 per share for the remainder of the trading day.¹⁴⁰

¹³⁷ At her deposition, Ms. Allen testified that "all of the analysts that reported on this said that the price -- exclusively attribute the price decline on that date is speculation about Suriname -- about Apache Suriname exploration." (See Allen Deposition, 157:14–17.)

¹³⁸ RBC Capital Markets, "APA - SVP Resignation Causing Stock Weakness; Company Indicating Not Related to Maka-1 Outcome," October 25, 2019, 10:19 AM (emphasis added).

¹³⁹ Bloomberg, "***Apache Says SVP Keenan's Departure Not Connected to Suriname,**" October 25, 2019, 11:21 AM (emphasis added).

¹⁴⁰ At her deposition, Ms. Allen conceded that "[she] didn't do any specific intraday analysis of Apache's stock price on October 25, 2019." (See Allen Deposition, 165:2–7.)



38. Shortly thereafter, additional financial news outlets reported that “[Mr. Keenan’s] departure is not connected to the company’s exploration program in Suriname,”¹⁴¹ and that, according to “Houston-based Apache ... ‘the drill bit is still above the first target zone in the Suriname well.’”¹⁴² Analysts not only parroted the Company’s assurances about Suriname, but they also stated that they “[did] not believe the departure [was] linked to results of the well.”¹⁴³

¹⁴¹ *Theflyonthewall.com*, “11:34 EDT Apache tells Bloomberg SVP’s departure not connected to SurinameShares...,” October 25, 2019. *See also Reuters*, “Oil Industry veteran Steven Keenan resigns from Apache Corp,” October 25, 2019, 2:12 PM.

¹⁴² *Reuters*, “Oil Industry veteran Steven Keenan resigns from Apache Corp,” October 25, 2019, 2:12 PM.

¹⁴³ SunTrust Robinson Humphrey, “Resignation Not Linked to Upcoming Suriname Well Results,” October 25, 2019.

In fact, all three analysts that issued reports that day pointed to Mr. Keenan's role in Alpine High as likely contributing to his resignation, given the play's disappointing performance:

- **Credit Suisse:** "Mr. Keenan moved from EOG to APA in 2014 as Regional VP of Unconventional Resources and subsequently oversaw the discovery of the Alpine High play, which has been an economic disappointment for investors (at least partly due to depressed natural gas and NGL prices). Nonetheless, since APA unveiled the play in September 2016, its shares have underperformed global E&Ps by >30%, likely a cause for Mr. Keenan's resignation. ... While Mr. Keenan's exact role in Suriname is not clear (APA claims the resignation is not connected to the exploration prospect) ..."¹⁴⁴
- **RBC Capital Markets:** "Based on our conversation with APA, as of the resignation date, the company had not reached the target objective at the Maka-1 prospect and the resignation was related to other matters. They further indicated that there is a team in place and the work has been accomplished with regards to the more than dozen prospects in the Suriname region. Mr. Keenan was a major part of the team that discovered the Alpine High play that has been a significant investment for APA. However, we think the outcome of results from Alpine High have not met high expectations and due to weakening natural gas and NGL prices, we expect that APA could allocate activity away from Alpine high in favor of oilier targets in other parts of the Permian. The Maka-1 exploration well spud around 9/23/2019 and we are currently expecting the company to have results by mid-November."¹⁴⁵
- **SunTrust Robinson Humphrey:** "Apache's stock underperformed this morning (down ~5.5% vs. XOP up ~1 %) on investor speculation that a SVP's resignation (See Link) is linked to an upcoming unsuccessful Suriname Maka-1 exploration well in Block 58. We do not believe the departure is linked to results of the well as it does not appear that the well has reached its target formation yet. Faron Thibodeaux is the SVP in charge of Suriname while the departed SVP was a part of the team that discovered Alpine, which has been been [sic] disappointing with investors given the weak returns due to the high gas nature.

We anticipate Apache will soon signal a strategic shift away from Alpine High and toward higher oil cut regions such as the Midland Basin and Egypt, though we are unlikely to see full 2020 guidance. We will look for color surrounding the company's ongoing seismic shoot in the Western Desert in

¹⁴⁴ Credit Suisse, "Resignation of Exploration Head Highlights Suriname Risk to Share Price," October 25, 2019 (emphasis added).

¹⁴⁵ RBC Capital Markets, "APA - SVP Resignation Causing Stock Weakness; Company Indicating Not Related to Maka-1 Outcome," October 25, 2019, 10:19 AM (emphasis added).

APNs Egypt position, multiple development pads in the Midland Basin, and a timing update on the first Suriname Block 58 well on the upcoming earnings release.”¹⁴⁶

39. News reports discussing the resignation likewise emphasized Mr. Keenan’s role in the Alpine High shale discovery, including referencing the alleged false statements Defendants made on September 7, 2016 when announcing Alpine High, and its more recently revealed disappointing performance:

- ***Reuters***: “Oil and gas industry veteran Steven Keenan, who was credited with a high-profile shale discovery for Apache Corp, resigned on Wednesday from his position as senior vice president of worldwide exploration, the company said on Friday ... Keenan has overseen the company’s exploration operations, unconventional resources technology team and operations in the Delaware basin since joining Apache five years ago. Keenan is widely credited with the Alpine High find in West Texas in 2016. When Alpine High was discovered Apache’s shares spiked as much as 14% with Chief Executive Officer John Christmann calling it a ‘world class resource’. However more recently Alpine High has struggled due to lower gas prices, with the company saying it would reassign capital expenditure to other areas.”¹⁴⁷
- ***Bloomberg News***: “Not long after [Steven Keenan] joined Apache, the company announced its Alpine High discovery in a little-drilled corner of the Permian Basin in West Texas. At the time, the company said the play held 3 billion barrels of crude and 75 trillion cubic feet of gas.

But Apache’s stock has underperformed rival producers since it first touted the Alpine High find, which turned out to be far richer in gas than more valuable crude.”¹⁴⁸

40. In fact, before and after his resignation from the Company, both Apache itself as well as numerous news commentators widely credited Mr. Keenan with the “high-profile shale

¹⁴⁶ SunTrust Robinson Humphrey, “Resignation Not Linked to Upcoming Suriname Well Results,” October 25, 2019 (emphasis added).

¹⁴⁷ *Reuters*, “Oil industry veteran Steven Keenan resigns from Apache Corp,” October 25, 2019, 2:12 PM (emphasis added); *see also* Complaint, ¶192.

¹⁴⁸ *Bloomberg News*, “Apache Executive’s Departure Sparks Worst Rout Since 2016 (2),” October 25, 2019, 1:55 PM (emphasis added); *see also* Complaint, ¶191.

discovery” at Alpine High, with Apache inviting Mr. Keenan to participate in the Company’s announcement of the play and on a later date presenting him with a “President’s Award” for making the discovery, and one reporter even publicly characterizing Keenan as the “Godfather of Alpine High”:

- **Apache Conference Call (9/7/2016):** “And now, we have a new organic play that we’re going to talk about next and we did it in a very, very low entry cost. So, before I do this, there’s a team that I’m really going to give a lot of credit to because it takes unique individuals, and I think some of the business’ very best to uncover something like this, but I’m also going to take all the Apaches around the world because, without all the hard work and effort, all the cost cutting, every barrel we squeeze that let us put our opportunity set into this what is now the next resource play, the Alpine High, it wouldn’t be possible. So, this truly is an Apache discovery, and I’m proud to tell you it was a team approach and everybody’s had a hand in it even if they didn’t know they had a hand in it. Sitting in with me today is Steve Keenan. He joined us in 2014. He’s been able to build an organization in San Antonio that, quite frankly, I’ll put up against any organization in the business.”¹⁴⁹
- **Seeking Alpha (9/8/2016):** “A major thing to consider in all of this is the value Steven Keenan added to Apache when it hired him away from EOG Resources in 2014. It was his conclusion after a period of exploration, which previous explorers were only able to drill 110 dry holes, that [Alpine High] had a lot of potential yet to be discovered. In other words, Keenan is a moat for Apache that gives it an advantage over its peers.”¹⁵⁰
- **Forbes (9/8/2016):** “[W]hen we come across a story of a major oil company or large independent producer having success in adding massive new reserves to its portfolio via old-fashioned notions like rigorous study of 3D seismic, thermal maturity and mineralogy, and aggressive new leasing of lands in a target area that other large companies have written off over the years, it is viewed as quite a novelty in this modern era. For the story to involve the discovery of between 1.1 to 2.7 billion barrels of oil equivalent (BOE) that test wells indicate are economic to produce at current commodity prices or lower is truly extraordinary. Yet, in our interview on Wednesday, Apache Corporation’s Senior VP of North American Unconventional Resources, Steve Keenan, said that is precisely the story behind Apache’s new Alpine

¹⁴⁹ *Bloomberg Transcript*, “Barclays CEO Energy Power Conference,” September 7, 2016 (emphasis added).

¹⁵⁰ *Seeking Alpha*, “Apache’s New Oil And Gas Discovery Could Yield As Much As \$80 Billion,” September 8, 2016, 2:44 AM (emphasis added).

High discovery at the base of the Davis Mountains in West Texas. Keenan has had a 38-year career in the industry, mostly with EOG Resources prior to coming to Apache, the last 15 of which have been spent in the evaluation and development of unconventional resources.”¹⁵¹

- ***Houston Chronicle* (1/1/2017):** “[F]or Keenan, Alpine High was the culmination of a lifetime looking for gas and oil”¹⁵²
- ***Apache 2017 Annual Shareholder Meeting (5/11/2017):*** “The President’s Award is given to an outstanding employee who has demonstrated excellence through hard work, teamwork, character, innovation, leadership and results. ... **Here at Apache, he and his team have made a significant discovery at Alpine High. It’s a field that will deliver incredible value to Apache and its shareholders for many, many years to come. ... Ladies and gentlemen, I’m pleased to announce my choice for this year’s President’s Award is our Senior Region Vice President of our North American Unconventional Resources team, Mr. Steve Keenan.**”¹⁵³
- ***TPH Energy Resource (10/28/2019):*** “Friday’s underperformance (-11% lows vs. E&P -1% lows) was driven by market speculation regarding the departure of Steve Keenan, APA’s former SVP of Worldwide Exploration and San Antonio Region. Early chatter questioned if initial Suriname results were to blame, but timing of operations suggest otherwise, **leaving TPHe Alpine High (AH) reductions-to-come as the more likely culprit.** At strip, even giving APA the benefit-of-the-doubt on its AH productivity assumptions, we see a 30% ATROR breakeven of ~\$3.15/mcf which has us modeling a -4 rig reduction (to 2) to AH activity[.]”¹⁵⁴
- ***Houston Chronicle (10/30/2019):*** “Keenan was charged with finding Apache’s next big discovery and he seemingly did just that with Alpine High.”¹⁵⁵

¹⁵¹ *Forbes*, “Apache’s Alpine High Discovery Defies Conventional Wisdom,” September 8, 2016, 5:41 PM. *See also Forbes*, “Apache Corp. Represents The Thorn That America’s Oil Frackers Have Stuck In The Side Of OPEC,” September 28, 2016, 10:06 AM; *Forbes*, “The Alpine High: A Big Deal Last September, An Event Bigger Deal Today,” March 2, 2017, 11:24 AM.

¹⁵² *Houston Chronicle*, “BIG RISK, BIGGER REWARD; OIL MAVERICK’S GAMBLE PAYS OFF FOR APACHE,” January 1, 2017.

¹⁵³ *Bloomberg Government Disclosure*, “Apache Corp Annual Shareholders Meeting – Final,” May 11, 2017 (emphasis added).

¹⁵⁴ APACHE_00122800 at 801 (emphasis added).

¹⁵⁵ *Houston Chronicle*, “Apache at crossroads as it pins hopes on Suriname offshore field,”

- ***Bloomberg News (11/13/2019)***: “It was under Keenan’s watch that Apache developed the company’s flagship Alpine High discovery. Recently, however, Apache has had to shift rigs from Alpine High to oilier parts of the Permian Basin amid depressed natural gas and natural gas liquids prices.”¹⁵⁶
- ***Seeking Alpha (2/28/2020)***: “The departure of Steve Keenan, Apache’s SVP of World Wide Exploration did not pass without notice last fall. The stock dropped in part because Keenan was the Godfather of Alpine High.”^{157, 158}

41. Moreover, it is my understanding that any conclusion regarding the reason(s) for Mr. Keenan’s resignation would be premature at this stage of the litigation, given that fact discovery is still in its early stages. That said, contrary to Ms. Allen’s unsupported inference, I understand

October 30, 2019.

¹⁵⁶ *Bloomberg News*, “Apache to Cut Workforce Up to 15% as Driller Eyes Overhaul,” November 13, 2019, 5:00 AM.

¹⁵⁷ *Seeking Alpha*, “Apache Corporation: Look Out Below,” February 28, 2020, 12:08 PM (emphasis added).

¹⁵⁸ Online chatgroup discussions also provide evidence that investors viewed Mr. Keenan’s resignation as related to Alpine High. *See, e.g.*, <https://seekingalpha.com/news/3509781-apache-chopped-on-word-of-key-execs-departure?hasComeFromMpArticle=true>:

- OilBull123 (October 25, 2019, 2:29 PM): “My guess is it’s more related to Alpine High being a bust by all appearances. I believe APA is reassigning capex from AH to other areas.”
- David Rahnis (October 26, 2019, 11:13 AM): “It is strange the lack of clarity around his resignation. I think if it was retirement or family reasons they would have said so. So must be performance based I guess. Leaves too many unanswered questions and I think that’s why stock tanked.”
- MoatMaker (October 30, 2019, 5:34 PM): “Let me tell you the truth about Steve Keenan’s departure. He was fired. SK came in, destroyed great company culture, squandered 100s of millions on pet projects, and fired anyone he felt threatened by. Technically he was weak... he didn’t understand basic fundamentals, would often try to hide behind jargon, and would blatantly hide or ignore data that was contrary to his story. And, when it comes to Alpine High the play started off as 30k acres of oil acreage in the very northern area... Then, in desperation to try and show impact Keenan and his cronies seized the project from the group that started it, secretly leased 300k acres and as a result the company has suffered mightily. And that, is the real story on Steve Keenan.”

that the limited discovery provided by Defendants to date supports Plaintiffs’ position that Mr. Keenan’s resignation was due to Alpine High’s performance. Notably, Ms. Allen makes no mention of it in her price impact analysis. For example, as described in the Complaint, a “confidential internal review of Alpine High data—code-named ‘Project Neptune’”¹⁵⁹—that was conducted during the Fall of 2019 concluded that:

(i) Apache’s data did not support and had never supported public type curves and other representations the Company had touted as support for Defendants’ representations about play-wide “well economics” and the value of Alpine High (instead, the quality of the wells and oil and gas Apache had drilled was far worse than what Defendants had represented); (ii) only if several highly favorable assumptions were applied could even some of the Alpine High wells be minimally economically viable; and (iii) the substantial majority of the Alpine High wells were not and had never been economically viable, even with the beneficial assumptions.¹⁶⁰

The Project Neptune team “provided the presentation, including all of the foregoing conclusions, to Apache’s senior management, including Christmann, as part of an in-person meeting with Christmann, in mid-October 2019.”¹⁶¹ Less than two weeks later, “media reports surfaced on October 25, 2019 that Keenan had abruptly ‘resigned.’”¹⁶²

42. Additionally, Defendants have produced internal documents, including a presentation titled, “Project Neptune Update,” dated October 14, 2019, showing that a retrospective, internal review of Alpine High data gathered since the play’s inception concluded that the “**actual results**” at Alpine High were “**materially below the published [data]**,”¹⁶³ and “**not even in the**

¹⁵⁹ Complaint, ¶6.

¹⁶⁰ Complaint, ¶96.

¹⁶¹ Complaint, ¶100. *See also* APACHE_00005833.pdf (“Project Neptune Update,” October 14, 2019).

¹⁶² Complaint, ¶102.

¹⁶³ APACHE_00005731 (October 14, 2019 “Project Neptune Update”) at 5751 (emphasis added).

ballpark” of the production amounts Defendants repeatedly touted.¹⁶⁴ As a result, the Project Neptune team recommended an “[e]xternal communications reconciliation”¹⁶⁵ a mere 10 days before Keenan’s departure. Thus, I understand that Defendants have produced internal documents corroborating the market’s understanding that the timing of Keenan’s resignation was directly linked to the performance of Alpine High. At her deposition, Ms. Allen testified that she did not consider any internal Apache documents bearing on price impact.¹⁶⁶

43. In sum, Ms. Allen has no basis to conclude that Apache’s stock price decline following the October 25, 2019 alleged partial corrective disclosure is not evidence of price impact, given that: (i) news of Mr. Keenan’s departure undisputedly caused a statistically significant decline in the price of Apache stock on October 25, 2019; (ii) Ms. Allen has not identified any other factor that may have contributed to the stock price decline that day; (iii) the Company did not provide a reason for the departure, but explicitly stated that it was “not connected to Suriname”; (iv) Mr. Keenan was considered the “Godfather” of Alpine High, and the Company and financial media publicly credited the “discovery” of Alpine High to his “innovative” work on the play; (v) all analysts that issued reports following the disclosure, as well as news commentators, cited the disappointing performance of Alpine High; and (vi) any assumptions regarding the reason(s) for Mr. Keenan’s departure are premature given that fact discovery is ongoing.

VIII. Ms. Allen Fails to Demonstrate a Lack of Price Impact Associated With the March 16, 2020 Alleged Corrective Disclosure

44. On March 16, 2020, prior to market open, *Seeking Alpha* issued a report on Apache “reveal[ing] that, in the wake of an oil price crash, enormous spending, and lack of production

¹⁶⁴ *Id.* at 5738 (emphasis added).

¹⁶⁵ *Id.* at 5732 (emphasis added).

¹⁶⁶ *See* Allen Deposition, 34:25–35:13; 157:18–21.

from Alpine High, Apache was particularly challenged amongst its E&P peers.”¹⁶⁷ The *Seeking Alpha* article noted that the Company had “shift[ed] capital away from the wet-gas rich Alpine High play which has been driving the company’s production growth,” and that “Apache also reduced Alpine High's value by \$1.4 billion.”¹⁶⁸ The analyst calculated that Apache’s “lofty debt-to-equity ratio” was “the highest among all large-cap independent oil producers”:

I think what puts Apache in a difficult spot is that its financial health isn’t great. It has a weak balance sheet marked by high levels of debt, which limits the company’s ability to use additional borrowings to fund a cash flow shortfall. At the end of last year, Apache had \$8.16 billion of debt (ex. debt associated with Altus Midstream (ALTM)), which translates into a lofty debt-to-equity ratio of almost 250% - the highest among all large-cap independent oil producers, as per my calculations.¹⁶⁹

45. As Plaintiffs have alleged, that same day, also before market open, Susquehanna Financial Group, LLLP (“Susquehanna”) issued a report in which it downgraded its rating for Apache to Neutral from Positive.¹⁷⁰ Susquehanna slashed its price target for the Company to \$9.00 from \$35.00, stating that the rating downgrade was “primarily governed by our view on balance sheet flexibility” and adding that “balance sheet flexibility is a main parameter in our stock selection process with factors such as inventory depth, capital intensity, and valuation still playing an important role in the calculus.”¹⁷¹ Consistent with the *Seeking Alpha* article also published on March 16, 2020, Susquehanna estimated that Apache’s “Net Debt/EBITDA” ratio

¹⁶⁷ Complaint, ¶315.

¹⁶⁸ *Seeking Alpha*, “The Oil Price Crash Puts Apache Corporation In A Tough Spot,” March 16, 2020, 3:35 AM.

¹⁶⁹ *Ibid.*

¹⁷⁰ Complaint, ¶315.

¹⁷¹ Susquehanna, “Sector Update: Downgrading APA, NBL, OXY to Neutral; Upgrade COG to Positive,” March 16, 2020. *See also* Complaint, ¶315; *Bloomberg First Word*, “Apache Cut to Neutral at Susquehanna; PT \$9,” March 16, 2020, 6:01 AM; *Dow Jones Newswire*, “Apache Corp Cut to Neutral From Positive by Susquehanna,” March 16, 2020, 1:06 PM.

for 2020 and 2021 would be 5.6x and 4.8x, respectively, both of which were the highest among the “International/Diversified E&Ps” and the second and third highest, respectively, among all 22 E&P companies covered by the analyst.¹⁷² According to Plaintiffs, “[a]s a direct result of the March 16, 2020 partial corrective disclosure revealing that Apache’s failed Alpine High foray severely constrained its financial position relative to its competitors, Apache’s stock price fell \$3.61 per share over two trading days, or approximately 45%, from a close of \$8.07 per share on March 13, 2020, to close at \$4.46 per share on March 17, 2020.”¹⁷³

46. Ms. Allen does not dispute that the Company-specific declines in the price of Apache common stock on March 16 and March 17, 2020 are statistically significant under my event study, as well as under her alternative event study.¹⁷⁴ Instead, she concludes that the “March 16, 2020 alleged corrective disclosure shows no price impact,” for the following three reasons:

- i. “no analyst or news story mentioned the Seeking Alpha article, let alone tied it to any price drop;”
- ii. “there was no new news [in the Seeking Alpha report] about Apache at all, let alone Alpine High;” and
- iii. “both Dr. Nye’s event study model and the alternative event study model are not applicable to this date due to increased market volatility.”¹⁷⁵

47. However, Ms. Allen’s analysis is not substantiated by evidence and incomplete, at best, thereby rendering her price impact conclusion with respect to the March 16, 2020 alleged

¹⁷² *Ibid.* (Susquehanna defined Net Debt/EBITDA as “Net Debt (gross debt less cash on hand) / EBITDA = forward year EBITDA estimate.”)

¹⁷³ Complaint, ¶316.

¹⁷⁴ Under the Nye event study model, the Company-specific declines on March 16 and 17, 2020 are statistically significant at the 100.00% and 99.99% confidence levels, respectively. (*See* Nye Report, Exhibit 11B.) Under Ms. Allen’s alternative event study model, the Company-specific declines on March 16 and 17, 2020 are both statistically significant at the 100.00% confidence level. (*See* NERA_019129.)

¹⁷⁵ Allen Report, ¶76.

corrective disclosure unreliable. As an initial matter, she does not even mention, let alone analyze, the March 16, 2020 Susquehanna report downgrading its Positive rating for Apache and slashing its price target—a disclosure allegedly revealing Apache’s “severely constrained [] financial position relative to its competitors.”¹⁷⁶ Moreover, Susquehanna’s “[s]ector [u]pdate” report clearly contained “new news about Apache” in the form of a downgraded investment recommendation, severely reduced price target, and a revised “Net Debt / EBITDA” ratio projection, which the analyst “now s[aw] ... exceeding 3.0x by the end of 2021.”¹⁷⁷ Susquehanna further remarked that, while Apache had “already announced activity reduction and ... slashed dividend payments, additional cutbacks may be necessary.”¹⁷⁸

48. Additionally, by asserting that the event study models are “not applicable to this date due to increased market volatility [starting in March 2020],”¹⁷⁹ Ms. Allen effectively fails to conduct any event study whatsoever of the March 16, 2020 alleged corrective disclosure. Indeed, she makes no attempt to account for any such changes in volatility, and instead just discards the observed statistically significant price declines under both my event study and her alternative

¹⁷⁶ Complaint, ¶¶315–316: “That same day, Susquehanna Financial Group downgraded Apache shares, highlighting a lack of ‘balance sheet flexibility’ and noting Apache’s ‘net leverage exceeding 3.0x by the end of 2021.’ As a direct result of the March 16, 2020 partial corrective disclosure revealing that Apache’s failed Alpine High foray severely constrained its financial position relative to its competitors, Apache’s stock price fell \$3.61 per share over two trading days”

¹⁷⁷ Susquehanna, “Sector Update: Downgrading APA, NBL, OXY to Neutral; Upgrade COG to Positive,” March 16, 2020.

¹⁷⁸ *Ibid.*

¹⁷⁹ Allen Report, ¶76.

event study.^{180, 181} In doing so, however, Ms. Allen not only fails to substantiate her opinion with evidence, she also fails to consider academic literature, which details how event studies can be designed to reliably control for changing market- and industry-wide volatility dynamics.¹⁸² For example, according to Ms. Allen’s colleagues at NERA, “[t]he simplest way to resolve the issues associated with performing an event study over a period of heightened volatility would be to use the disclosure period as the estimation period. One can ‘overlap’ the estimation and the disclosure period, by construction guaranteeing similar volatilities between the two periods.”¹⁸³

¹⁸⁰ Allen Report, ¶76.

¹⁸¹ Ms. Allen argues that “Dr. Nye does not even discuss how the heightened market volatility in March 2020 would affect interpretations of his event study results.” (Allen Report, ¶94.) However, contrary to Ms. Allen’s price impact analysis, which explicitly addresses the March 16, 2020 alleged corrective disclosure, none of the event dates under study in the Nye Report, which examined stock price returns to assess market efficiency, occurred in March 2020 or later. (See Nye Report, Exhibit 12.)

¹⁸² See, e.g., Mitchell, Mark L. and Jeffry M. Netter, 1994, “The Role of Financial Economics in Securities Fraud Cases: Applications at the Securities and Exchange Commission,” *The Business Lawyer*, Vol. 49, pp. 545–590 at 566 (“[I]t is important to account for [] marketwide movements, especially during periods when the market is volatile.”); and Jovanovic, Branko, and Edward Fox, NERA Economic Consulting, “Testing for Materiality in Volatile Markets,” January 12, 2010, p. 1 (“Inferences from an event study will be stronger when the period used to calculate the expected returns and expected volatility (the estimation period) and the period in which the alleged disclosure occurred (the disclosure period) are similar except for the release of news related to the alleged fraud.”).

¹⁸³ Jovanovic, Branko, and Edward Fox, NERA Economic Consulting, “Testing for Materiality in Volatile Markets,” January 12, 2010, p. 4.

49. Here, Ms. Allen asserts that “[t]he Covid pandemic, along with the oil price war between Saudi Arabia and Russia, caused significant market uncertainty during March 2020.”^{184, 185} As shown in the following table, however, if one were to modify the estimation period (*aka* the control period), as the NERA authors suggest, to overlap with the “heightened market volatility due to the Covid pandemic” during March 2020, the two-day Company-specific return on March 16 and 17, 2020 is still statistically significant at above the 95% confidence level. This is true regardless of whether one uses the market and industry indices used in the Nye Report, or the market and industry indices employed by Ms. Allen. It is also true across a range of control period lengths:¹⁸⁶

¹⁸⁴ Allen Report, ¶88. Ms. Allen describes “key dates and events during this unprecedented time period,” which include events as early as March 5, 2020, when “[OPEC] proposed production cuts, intending to ‘deal with the effects of the spreading coronavirus on demand.’” She also cites a March 9, 2020 CNN article to support her assertion that in “[e]arly 2020,” “Covid and associated shutdowns caused economic disruption and reduced demand for oil (especially in China, one of the world’s largest oil importers).” (Allen Report, ¶90.)

¹⁸⁵ At her deposition, Ms. Allen conceded that she did not attempt to alter the estimation period of her event study model in order to account for this increased volatility. (*See* Allen Deposition, 178:12–16.)

¹⁸⁶ In the following table, each control period excludes the event dates under study (*i.e.*, March 16 and March 17, 2020). *See* Campbell, John Y., Andrew W. Lo, and A. Craig MacKinlay, *The Econometrics of Financial Markets*, Princeton University Press, 1997, p. 152 (“Generally the event period itself is not included in the estimation period to prevent the event from influencing the normal performance model parameter estimates.”). *See also* Jovanovic, Branko, and Edward Fox, NERA Economic Consulting, “Testing for Materiality in Volatile Markets,” January 12, 2010 (“One must ensure that all disclosures and misrepresentations, as well as any other news associated with the fraud, are excluded from the estimation period in order to obtain a ‘clean’ benchmark.”). I note, however, that the results do not change in a meaningful way if one were to include March 16 and March 17, 2020 in the control period.

Control Period	Impact Date	Nye Industry Index		Allen Industry Index	
		Company-Specific Return	Confidence Level	Company-Specific Return	Confidence Level
1-Year Prior (Original)	3/16/2020	-15.35%	100.0%	-17.10%	100.0%
	3/17/2020	-12.69%	100.0%	-16.54%	100.0%
	2-Day Event Window	-28.04%	100.0%	-33.63%	100.0%
3/2/2020 - 4/30/2020 (2 Months)	3/16/2020	-16.02%	98.0%	-15.23%	94.7%
	3/17/2020	-12.17%	92.7%	-14.28%	93.1%
	2-Day Event Window	-28.19%	99.6%	-29.51%	99.1%
3/2/2020 - 5/29/2020 (3 Months)	3/16/2020	-15.58%	99.3%	-15.24%	98.1%
	3/17/2020	-11.59%	95.9%	-14.15%	97.1%
	2-Day Event Window	-27.18%	99.9%	-29.39%	99.8%
3/2/2020 - 6/30/2020 (4 Months)	3/16/2020	-15.47%	99.7%	-15.35%	99.2%
	3/17/2020	-11.80%	98.0%	-15.14%	99.1%
	2-Day Event Window	-27.26%	100.0%	-30.48%	100.0%
3/2/2020 - 7/31/2020 (5 Months)	3/16/2020	-15.43%	99.7%	-15.34%	99.3%
	3/17/2020	-12.79%	98.6%	-15.75%	99.4%
	2-Day Event Window	-28.22%	100.0%	-31.09%	100.0%
3/2/2020 - 8/31/2020 (6 Months)	3/16/2020	-15.29%	99.9%	-15.19%	99.6%
	3/17/2020	-12.90%	99.3%	-15.85%	99.8%
	2-Day Event Window	-28.19%	100.0%	-31.05%	100.0%

Source: Nye Report Exhibit 11; NERA_019129

50. Furthermore, Ms. Allen fails to identify any news other than the March 16, 2020 alleged corrective disclosure that could explain the statistically significant Company-specific decline in Apache's stock price on March 16 and March 17, 2020. By definition, event studies control for contemporaneous market and industry movements that may influence a specific company's stock price on a given day, thereby producing an estimate of the stock price change due to company-specific factors unrelated to such effects (*i.e.*, an estimate of the residual or company-specific return that day).¹⁸⁷ Clearly, the "Covid pandemic, along with the oil price war between Saudi Arabia and Russia," qualify as market and industry-wide events.¹⁸⁸ Yet, Ms. Allen has not explained why, under her event study model, Apache's stock price declined by a

¹⁸⁷ See Allen Report, ¶¶32, 33.

¹⁸⁸ Allen Report, ¶88; Allen Deposition at 175:16–22 (testifying that the COVID pandemic and the oil price war were "not Apache specific events," but rather ones that affected "the whole market").

staggering -17.10% on March 16, 2020 and -16.54% on March 17, 2020 after netting out such market and industry-wide effects.

51. Lastly, Ms. Allen argues that “unlike analyst reports that are issued by professional financial analysts at brokerage firms, *Seeking Alpha* is a provider of crowdsourced content and not a ‘licensed securities dealer, broker or US investment adviser or investment bank.’”¹⁸⁹

However, Ms. Allen’s attempt to discredit *Seeking Alpha* as a source of value-relevant information for investors is unsupported. Indeed, at her deposition, Ms. Allen clarified that she does not dispute that *Seeking Alpha* articles can “contain new or relevant information about a company” and can “provide evidence of price impact.”¹⁹⁰ Moreover, it is my understanding that a similar attempt by Ms. Allen to discredit price impact associated with a *Seeking Alpha* article was recently rejected.¹⁹¹

52. In sum, Ms. Allen has failed to prove a lack of price impact associated with the March 16, 2020 alleged corrective disclosure, given that (i) Ms. Allen has not considered the full set of information released on March 16, 2020 that Plaintiffs allege was corrective (*i.e.*, the Susquehanna report); (ii) she admittedly fails to put forth an event study model that, in her opinion, is “applicable” to March 16 and 17, 2020 and supportive of her opinion;¹⁹² (iii) applying “[t]he simplest way to resolve the issues associated with performing an event study over a period

¹⁸⁹ Allen Report, ¶78.

¹⁹⁰ Allen Deposition, 182:18–25.

¹⁹¹ See, e.g., *St. Clair Cnty. Employees’ Ret. Sys. v. Acadia Healthcare Co., Inc.*, 2022 WL 4598044, at *8 (M.D. Tenn. Sept. 30, 2022), where the court certified a class, finding “that Defendants [] failed to prove a lack of price impact as to the *Seeking Alpha* article.” It is my understanding that Ms. Allen was retained by defendants as an expert in that matter.

¹⁹² Allen Report, ¶76.

of heightened volatility”¹⁹³ yields Company-specific returns on March 16 and 17, 2020 that are statistically significant at above Ms. Allen’s 95% confidence level threshold; (iv) Ms. Allen has not identified any other information disclosed on March 16, 2020 that could explain the Company-specific declines in Apache stock on March 16 and 17, 2020; and (v) she provides no reliable basis or authority to discredit *Seeking Alpha* as a source of value-relevant information to investors.

IX. Ms. Allen’s “Big Picture Analysis” Fails to Demonstrate That the Alleged Misstatements and Omissions Lacked Price Impact During Her “Focus Period”

53. Ms. Allen argues that “a big picture analysis is consistent with no price impact” during the “Focus Period.”¹⁹⁴ Specifically, she claims that: (i) during the Focus Period, “there was no change in the market’s expectations about Alpine High’s reserves or the mix of oil and wet gas vs. dry gas,” and that “analysts maintained their view that Alpine High was a gas-weighted, NGL-rich play”;¹⁹⁵ (ii) “Apache’s stock moved in-line with the E&P industry during the Focus Period;”¹⁹⁶ and (iii) “downward changes in expectations of Alpine High, including decisions to reduce production and drilling, were due to changes in commodity prices during the Focus Period and were not in relation to any new understanding of the reserves or reserve mix at Alpine High.”¹⁹⁷

54. However, Ms. Allen’s “big picture analysis” is misleading for a number of reasons. Most notably, Ms. Allen seemingly disregards the fact that Apache stock traded in an efficient market

¹⁹³ Jovanovic, Branko, and Edward Fox, NERA Economic Consulting, “Testing for Materiality in Volatile Markets,” January 12, 2010.

¹⁹⁴ Allen Report, §VIII.

¹⁹⁵ Allen Report, ¶102 (and more generally Allen Report, §VII.A).

¹⁹⁶ Allen Report, ¶103

¹⁹⁷ Allen Report, ¶107.

(a fact she assumes was true throughout the Class Period),¹⁹⁸ which implies that its “price reflected the information disclosed to the market, and promptly responded to the disclosure of new, unexpected, value relevant information.”¹⁹⁹ Thus, immediately preceding each of the five alleged corrective disclosures, Apache’s efficient stock price would have already reflected the changing industry dynamics Ms. Allen identifies during the Focus Period, including the observed decline in commodity prices, as well as revised analyst expectations concerning Apache’s prospects for reasons unrelated to the alleged fraud. As a corollary, market efficiency dictates that the price declines observed following each of the alleged corrective disclosures must have been in response to incremental, new information revealed on those days alone. If Ms. Allen were correct that “Apache’s stock moved in-line with the E&P industry during the Focus Period,”²⁰⁰ then one would expect to see Apache’s stock price to have declined in tandem with other stocks in the E&P industry on the corrective disclosure dates. However, this is simply not the case. As shown in the following table, Apache’s stock price decline far exceeded the decline in the industry (if any) on each of the alleged corrective disclosure dates during the Class Period, including during Ms. Allen’s Focus Period.

¹⁹⁸ Allen Report, ¶1.

¹⁹⁹ Nye Report, ¶60.

²⁰⁰ Allen Report, ¶103.

APA Stock Price Return Compared to Industry on Alleged Corrective Disclosure Impact Dates			
Impact Date	APA Actual Return	Nye Industry Index ¹	Allen Industry Index ²
10/10/2017	-7.39%	-0.11%	-0.06%
2/22/2018	-6.32%	1.56%	2.44%
4/23/2019	-1.78%	-0.22%	-0.16%
4/24/2019	-2.61%	-0.60%	-1.90%
4/25/2019	-4.00%	-1.28%	-1.53%
4/26/2019	-2.94%	-1.75%	-1.44%
10/25/2019	-4.99%	0.51%	2.30%
3/16/2020	-32.34%	-14.01%	-14.08%
3/17/2020	-18.32%	-1.95%	-0.94%

[1] Nye Industry Index: S&P 500 Oil & Gas Exploration and Production Index (S5OILP) excluding Apache.

[2] Allen Industry Index: S&P 500 Oil & Gas Exploration and Production Select Index (SPSIOP) excluding Apache.

Source: Nye Report Exhibit 11; NERA_019129

55. Moreover, to the extent value-relevant information concerning the E&P industry or the broader stock market was released contemporaneously with the Apache-specific disclosures on these days, both my and Ms. Allen's regression models are designed to control for such effects. Indeed, our regression models include control variables for broad stock market effects and the E&P industry in particular,^{201, 202} thereby allowing us to remove such contemporaneous influences from our estimates of Apache's Company-specific stock price return (aka "abnormal" return) in response to the alleged corrective disclosures. As shown in the following table,

²⁰¹ Ms. Allen and I both control for broad market effects using the S&P 500 Index, while for industry effects we use the "S&P Oil & Gas Exploration & Production Select Industry Index" and the "S&P 500 Oil & Gas Exploration and Production Index," respectively.

²⁰² Allen Report, ¶28:

An event study is a commonly accepted statistical analysis that measures the movement in a stock's price after an event or public announcement, typically adjusting for the movement in the overall market and/or industry. Academics often use an event study to determine how stock prices respond to new information. An event study typically uses a statistical analysis called a regression to estimate the relationship between the company's daily stock returns and the daily returns of market and/or industry indices. Using the regression results and the returns of the indices, the predicted stock price movement and abnormal stock price movement (or the amount the stock price moves in excess of the predicted amount) can be calculated for the event/period being tested.

contrary to the notion that “Apache’s stock moved in-line with the E&P industry,”²⁰³ both my and Ms. Allen’s regression models estimate that Apache’s stock price decline far exceeded what our models predicted should have occurred given changing market and industry dynamics on each of the alleged corrective disclosure dates during the Class Period, including during Ms. Allen’s Focus Period:

	Alleged Corrective Disclosure Impact Date	Nye Event Study		Allen Alternative Event Study	
		Company-Specific Return	Confidence Level	Company-Specific Return	Confidence Level
	10/10/2017	-7.30%	100.00%	-7.29%	100.00%
	2/22/2018	-8.08%	100.00%	-8.67%	100.00%
Allen Focus Period	4/23/2019	-1.45%	70.64%	-1.37%	67.77%
	4/24/2019	-2.04%	86.06%	-0.75%	41.28%
	4/25/2019	-2.67%	94.62%	-2.47%	92.38%
	4/26/2019	-1.01%	53.29%	-1.31%	65.11%
	10/25/2019	-5.55%	99.92%	-7.37%	100.00%
	3/16/2020	-15.35%	100.00%	-17.10%	100.00%
	3/17/2020	-12.69%	99.99%	-16.54%	100.00%

Source: Nye Report Exhibit 11; NERA_019129

56. Furthermore, the fact that Apache’s stock price was generally correlated with those of other stocks in the E&P industry, as well as commodity prices, is entirely expected in an efficient market. Indeed, it is well established that the “Law of One Price implies that the price of a security should equal the present value of the expected cash flows an investor will receive from owning it.”²⁰⁴ Given that E&P companies generate cash flows by selling natural gas, crude oil, and/or natural gas liquids, it should be the case that their stock prices are mutually dependent on the prevailing market prices for such commodities. However, the notion that, during the Focus Period, Apache’s stock price was suddenly more “in-line with the E&P industry,”²⁰⁵ is nonsense.

²⁰³ Allen Report, ¶103.

²⁰⁴ Berk, Jonathan and Peter DeMarzo, 2007, *Corporate Finance*, Pearson Education, Inc., 1st Ed., Ch. 9, p. 245.

²⁰⁵ Allen Report, ¶103.

As shown in the following table, not only was Apache's stock price highly correlated with the E&P industry throughout the entire Class Period, but its daily returns exhibited virtually the same ~75% correlation during both the Focus Period and the Pre-Focus Period (*i.e.*, the portion of the Class Period for which Ms. Allen does not dispute price impact).

Apache Stock Vs. The S&P Oil & Gas Exploration & Production Select Industry Index		
Period	Date Range	Daily Return Correlation
Class Period	9/7/2023 - 3/13/2020	74.62%
Pre-Focus Period	9/7/2023 - 2/22/2018	74.67%
Focus Period	2/23/2018 - 3/13/2020	74.84%

57. Last, Ms. Allen's contention that the decline in Apache's stock price during her Focus Period was entirely driven by changes in the E&P industry is contradicted by the Company's own analysis. Specifically, in January 2020, Apache's then-Chairman of the Board, "John Lowe requested that Management review for the Board the history of the Alpine High investment, an assessment of key decisions taken along the way and an analysis of the estimated scale of the loss incurred."²⁰⁶ The resulting 35-page presentation provides a "5 Year Lookback on APA Performance With Primary Focus on Alpine High,"²⁰⁷ highlighting the following key findings:

[A] series of decisions related to Alpine High resulted in a significant loss of \$2-3 billion, or \$6.00-8.00 per share. Management accepts full and unconditional responsibility for this outcome. While the state of APA and the context of the timeframe for the Alpine High investment both help to explain why

²⁰⁶ APACHE_00000752. The "Purpose" of the presentation is described as follows:

This review will look at all aspects of the chronology of Alpine High and the quality of decision-making along the way. It will do this in the context of the state of APA at the beginning of 2015, other strategic initiatives considered and/or implemented during the last five years, and where APA stands today. It will also look at the impacts that Alpine High has had on Executive Compensation during the same period of time and compare that to the 'Shareholder Experience'. The purpose is to present a balanced view to whether there has been alignment between Executive Management and Shareholders with respect to the full five year period.

²⁰⁷ APACHE_00000751.

Alpine High seemed so attractive at the time, it does not excuse the outcome, nor management responsibility. ...

The APA share price has delivered a negative average annual return for investors both on an absolute basis (-8%) as well as relative to our TSR Peers (-3%) over the entirety of this tenure. ... This view includes the benefit of the recent share price improvement following on from the discovery in [Redaction – Confidential]. **Excluding that price impact, the outcomes are still very well aligned, just worse on both sides, with average annual Shareholder Returns of -16% absolute and -9% relative to our TSR Peers**²⁰⁸

58. Overall, the Company estimated that “aggregate value lost” from Alpine High was “in a range of \$2.0B to \$3.0B,”²⁰⁹ and page 16 of the presentation describes how APA under-performed compared to its TSR Peer group during 2017 and 2019 (*i.e.*, part of Ms. Allen’s Focus Period):

As shown on the next slide, over the last five years, APA share price has gone through periods of mostly under-performance or even-performance and brief periods [of] over-performance, relative to that of our TSR Peer group.

Over-performance came around two significant announcements - Alpine High and [Redaction – Confidential].

Under-performance came in two extended periods, both related to Alpine High.

The first period extended through most of 2017. This was the timeframe it became evident that Alpine High would predominantly be a rich gas play. Many investors simply did not like this.

The second period began with the gas and NGL price collapse in 2Q19 and extended through the rest of 2019 as investors came to believe this would result in reduced activity at Alpine High.

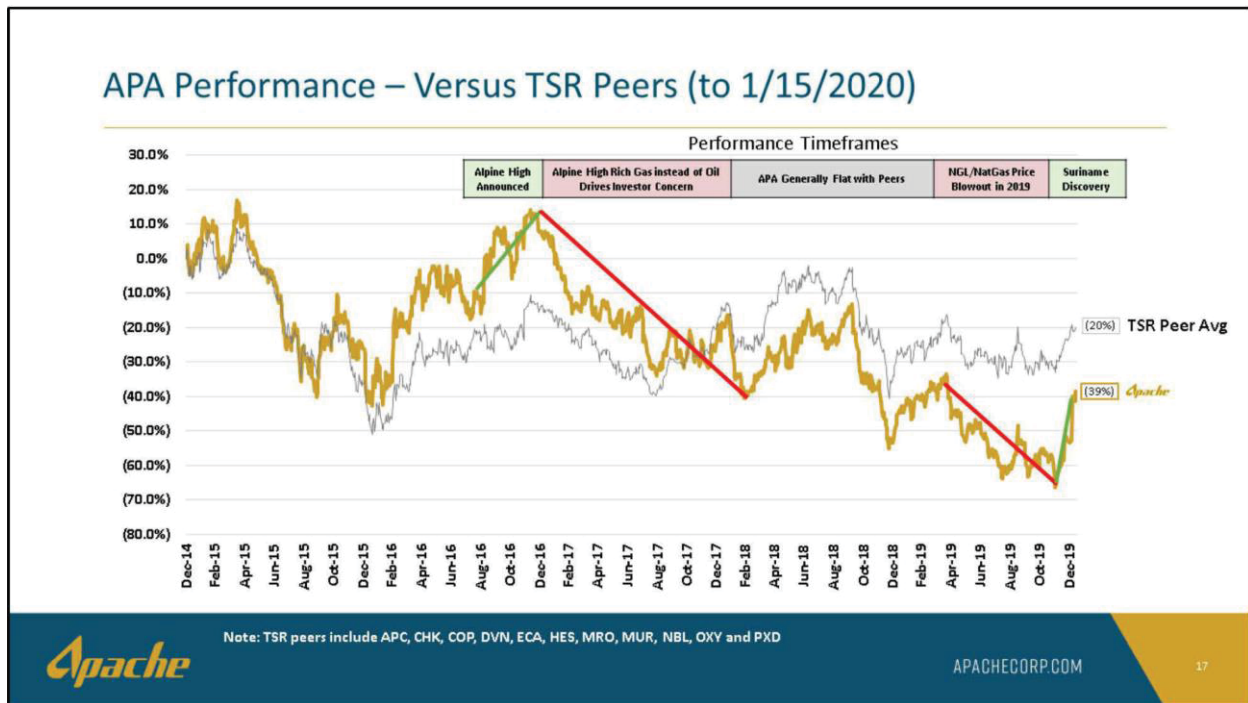
As referenced on the prior slide, Alpine High has probably resulted in \$6.00-8.00 of value impact on APA’s share price. Most of this value probably came out during 2017, **with any remaining value being lost in 2019.**²¹⁰

²⁰⁸ APACHE_00000754 (emphasis added).

²⁰⁹ APACHE_00000765.

²¹⁰ APACHE_00000766 (emphasis added).

59. As shown below, page 17 of the presentation graphically depicts Apache's "[u]nder-performance" during these "two extended periods, both related to Alpine High."²¹¹



60. In sum, Ms. Allen's "big picture analysis" of the Focus Period fails to demonstrate that the alleged misrepresentations lacked price impact, given that: (i) Apache's stock price decline far exceeded the decline in the industry (if any) on each of the alleged corrective disclosure dates during the Focus Period; (ii) both my and Ms. Allen's regression models estimate that Apache's stock price decline far exceeded what our models predicted should have occurred given changing market and industry dynamics on each of the alleged corrective disclosure dates during the Focus Period; (iii) Apache's stock price exhibited approximately the same level of daily return correlation with the E&P industry throughout the entire Class Period; and (iv) Ms. Allen's contention that the decline in Apache's stock price during her Focus Period was entirely driven by changes in the E&P industry is contradicted by the Company's own internal analysis.

²¹¹ APACHE_00000767.

X. Ms. Allen Improperly Conflates Statistical Significance and Price Impact

61. Much of Ms. Allen’s opinion that the alleged misrepresentations lacked price impact during the Focus Period is premised on her unjustified prerequisite that price impact can only be demonstrated when contemporaneous stock price changes are statistically significant at or above the 95% confidence level. According to Ms. Allen:

[W]hen analyzing the statistical significance of a price reaction to an event, the 5% statistical significance level (*i.e.*, the 95% statistical confidence level) is the commonly applied standard. If a price reaction is *not* statistically significant, it means that it is within the range of normal expected daily variation in stock prices and cannot be statistically distinguished from zero.²¹²

Notably, Ms. Allen does not dispute that Apache’s stock price declines following two of the three alleged corrective disclosures she analyzed during her Focus Period are statistically significant at or above her 95% threshold (*i.e.*, October 25, 2019 and March 16, 2020).²¹³

However, she does argue that: (i) “there was no statistically significant decline in Apache’s stock price following the April 23, 2019 press release”;²¹⁴ (ii) “there was no statistically significant price decline” on “four additional events during the Focus Period in Section V of [Plaintiffs’] Complaint”;²¹⁵ and (iii) “[t]here was no statistically significant increase on 12 of the 13 trading days following the alleged misrepresentations” made during her Focus Period.²¹⁶ Contrary to

²¹² Allen Report, ¶29 (emphasis in original).

²¹³ Under both the event study used in the Nye Report and the alternative event study used in the Allen Report, Apache’s stock price declines on October 25, 2019, March 16, 2020, and March 17, 2020 are statistically significant at above the 99.0% confidence level. (*See* Nye Report, Exhibit 11B; NERA_019129.) Thus, Ms. Allen’s arguments about a lack of statistical significance are limited to the April 23, 2019 alleged corrective disclosure.

²¹⁴ Allen Report, ¶48 (emphasis removed).

²¹⁵ Allen Report, ¶46, footnote 55, discussing “October 31, 2019, January 9, 2020, February 26–27, 2020, and March 12, 2020.”

²¹⁶ Allen Report, ¶36.

Ms. Allen’s opinion, as discussed further below, a failure to find statistical significance at a particular confidence level does **not** allow a financial economist to conclude there is evidence of a lack of price impact.

62. As an initial matter, it is important to note that the confidence level associated with a given company-specific return is measured as one minus the “*p*-value” of that return, where the *p*-value represents the conditional probability of observing a return as extreme as, or more extreme than, the return at issue. Thus, consistent with the standard frequently employed by social scientists, statistical significance in the context of securities litigation merely indicates that a given company-specific return is a relatively rare occurrence.²¹⁷ For example, statistical significance at the 95% confidence level (*i.e.*, a return with a *p*-value less than or equal to 5%) merely connotes that the return under study is among the top 5% of “normal” returns observed during the control period in terms of absolute magnitude (*i.e.*, either among the bottom 2.5% of the most negative returns or among the top 2.5% of the most positive returns). Ms. Allen acknowledges this well-known statistical fact when discussing a price reaction that is “statistically significant at the 23% [significance] level (*i.e.*, the *p*-value is 0.23),” stating that “it means that there is only a 23% chance that a price reaction of the same magnitude would be observed given the range of normal stock price volatility.”²¹⁸

²¹⁷ Kaye, David H. and David A. Freedman, “Reference Guide on Statistics,” in Federal Judicial Center, *Reference Manual on Scientific Evidence*, National Academies Press, 3rd ed., 2011 (“Reference Guide on Statistics”), pp. 250–252. (“Statistical significance is determined by comparing a *p* [*i.e.*, the probability of observing data as extreme as, or more extreme than, the actual data—given that the null hypothesis is true] to a preset value, called the significance level.” Thus, statistical significance “is merely a label for a certain kind of *p*-value.”) (The Reference Guide on Statistics is cited at Allen Report, footnote 37.)

²¹⁸ Allen Report, ¶30.

63. However, without any basis, Ms. Allen then leaps to the conclusion that “if Dr. Nye’s event study yields no statistically significant price reaction, it would provide evidence of no price impact.”²¹⁹ This is curious, given that Ms. Allen’s null hypothesis is effectively that the alleged misrepresentations or corrective events had **no effect** on Apache’s stock price. When testing the null hypothesis of “no effect,” a statistically significant result will have a small *p*-value (*i.e.*, less than 5%, when applying the 95% confidence level), thereby indicating “the observed data are far from what is expected under the null hypothesis—too far to be readily explained by the operations of chance. That discredits the null hypothesis.”²²⁰ However, while the *p*-value “gives the chance of getting evidence against the null hypothesis as strong or stronger than the evidence at hand,”²²¹ it “does not give the chance that the null is true,”²²² nor “the probability that ... the results occurred because of chance.”²²³ Indeed, “[a]ccording to the frequency theory of statistics, there is no meaningful way to assign a numerical probability to the null hypothesis.”²²⁴

64. Thus, Ms. Allen’s conclusion that certain events had no price impact because they did not induce a statistically significant stock price decline at or above the 95% confidence level is a fundamental error of statistical inference since she improperly infers that her null hypothesis is true—*i.e.*, that alleged misrepresentations or corrective events had **no effect**. To see why, consider that, according to Ms. Allen’s regression model, Apache’s Company-specific return

²¹⁹ Allen Report, ¶31.

²²⁰ Reference Guide on Statistics, p. 251.

²²¹ *Id.*, p. 250.

²²² *Ibid.*

²²³ Hubbard, Raymond and R. Murray Lindsay, 2008, “Why *P* Values Are Not a Useful Measure of Evidence in Statistical Significance Testing,” *Theory & Psychology*, Vol. 18, Issue 1, pp. 69–88 at 70.

²²⁴ Reference Guide on Statistics, p. 250.

of -1.37% on April 23, 2019 is also not statistically significantly different from -4.00% (at the 95% confidence level).²²⁵ Thus, if one were to commit the fallacy of accepting any null hypothesis that is not rejected at a 95% significance level (as Ms. Allen does), one would have to accept that both of the following propositions are true: (i) the true Company-specific return is zero, and (ii) the true Company-specific return is -4.00%. Obviously, both cannot be true, which is precisely why accepting a null hypothesis is fallacious. Indeed, for the April 23, 2019 alleged corrective disclosure, every Company-specific return between -4.11% and +1.36% would be accepted as true based on Ms. Allen's flawed methodology. The same logic applies to all of the alleged misrepresentations and corrective events, as well as every other day during the Class Period.

65. Furthermore, "[i]t is well known among applied scientists that a lack of impact or effect is not sufficiently established by a failure to demonstrate statistical significance. A failure to reject the null hypothesis of no effect may be the result of low statistical power when an important effect actually exists and the null hypothesis of no effect is in fact false."²²⁶ Ms. Allen's acceptance of the null hypothesis is particularly improper, given the well-known fact that single-firm event studies, such as those she conducted for Apache stock, have low statistical

²²⁵ Source: NERA_019129. Under Ms. Allen's event study, Apache's stock had a Company-specific return of -1.37%, and a standard error of 1.39%. Accordingly, a hypothesis test of whether the estimated Company-specific return of -1.37% can be statistically distinguished from -4.0% yields a t-statistic of 1.89 (*i.e.*, the quantity -1.37% minus -4.0%, divided by 1.39%), which is statistically significant at the 94.1% confidence level, under Ms. Allen's event study.

²²⁶ Hoenig, John M. and Dennie M. Heisey, 2001, "The Abuse of Power: The Pervasive Fallacy of Power Calculations for Data Analysis," *The American Statistician*, Vol. 55, No. 1, pp. 1–6 at 1.

“power,”²²⁷ and are thus prone to “accepting the null hypothesis when the alternative hypothesis is true” (*i.e.*, prone to making Type II errors).²²⁸ As noted by the *Barclays* court in the U.S.

District Court for the Southern District of New York:

In academic research, event studies are almost exclusively conducted with large samples of securities from a number of different firms. When the event study is used in a litigation to examine a single firm, the chances of finding statistically significant results decrease dramatically. “[T]he event study technique improves as the number of firms in the sample increase, as the number of days in the announcement window decrease, and as the alternative of a larger abnormal return is considered against the null hypothesis of zero abnormal return.” As to the latter point, neither the Supreme Court nor the Second Circuit has indicated whether the abnormal return must meet a particular threshold level, yet the success of an event study will depend on the size of the return it attempts to measure. The following example from the literature highlights the problems inherent in placing too much emphasis on event studies to measure market efficiency:

[i]n a sample size of twenty-five companies, the probabilities of detecting an abnormal return (or an effect on the stock price) of 0.5%, 1% and 2% is 24%, 71% and 100% respectively. But if the sample size is increased to 100 companies, the probabilities of detecting an abnormal return of 0.5%, 1%, and 2% is 71%, 94%, and 100% respectively. Thus, there is significant difference in detecting an abnormal return, or effect on the stock price, depending on the size of the event study.²²⁹

66. Consistent with *Barclays*, the Second Circuit has stated that “[e]vent studies offer the seductive promise of hard numbers and dispassionate truth, but methodological constraints limit their utility in the context of single-firm analyses.... Notably, small sample sizes may limit statistical power, meaning that only very large-impact events will be detectible.”²³⁰ In other words, single-firm event studies are inclined not to find statistical significance, when in fact a

²²⁷ *Carpenters Pension Trust Fund of St. Louis, et al. v. Barclays PLC, et al.*, Case No. 12-cv-5329 (SAS), Opinion and Order, dated August 20, 2015 (“*Barclays*”), pp. 33–35 (internal citations omitted).

²²⁸ Reference Guide on Statistics, p. 254, footnote 106.

²²⁹ *Carpenters*, pp. 33–35.

²³⁰ *In re Petrobras Securities*, Case No. 16-1914-cv (2d Cir. Jul. 7, 2017), pp. 64, 65 (internal citations omitted).

company-specific return was caused by the release of material, value-relevant information on a given event date.²³¹

67. Thus, while a finding of statistical significance under a single-firm event study is powerful evidence of price impact, the absence of statistical significance does not, as Ms. Allen erroneously claims, “demonstrate[] ... no price impact.”²³² Rather, contrary to Ms. Allen’s blind acceptance of the null hypothesis, given the low statistical power of single-firm event studies, it is entirely plausible that “[t]he null is false—but, by chance, the data happened to be of the kind expected under the null.”²³³ Indeed, “[w]hen a study with low power fails to show a significant effect, the results may therefore be more fairly described as inconclusive than negative. The proof is weak because power is low.”²³⁴

68. Additionally, there is no requirement in economics that material information must induce a price reaction that is considered to be statistically significant at a particular level. Indeed, the notion that material information must induce a statistically significant price reaction is incongruous with the fundamental tenets of financial economics. Specifically, the science of financial economics is predicated on: (i) the “Law of One Price,” which “implies that the price of a security should equal the present value of the expected cash flows an investor will receive from owning it”;²³⁵ (ii) the axiom of “semi-strong” form market efficiency, which states that “all publicly available information regarding the prospects of a firm must be reflected already in the

²³¹ *Id.*, p. 65, footnote 30, citing Alon Brav & J. B. Heaton, 2015, *Event Studies in Securities Litigation: Low Power, Confounding Effects, and Bias*, 93 Wash. U. L. Rev. 583.

²³² Allen Report, ¶52.

²³³ Reference Guide on Statistics, p. 254.

²³⁴ *Ibid.*

²³⁵ Berk, Jonathan and Peter DeMarzo, 2007, *Corporate Finance*, Pearson Education, Inc., 1st Ed., Ch. 9, p. 245.

[security's] price";²³⁶ and (iii) arbitrage pricing theory, which posits that security returns are determined by their systematic risk exposure, "plus another (zero expected value) random amount attributable to firm-specific events."²³⁷ Absent from these widely-accepted scientific principles is any reference to statistical significance. Accordingly, Ms. Allen's assertion that the lack of any statistically significant price reaction at or above the 95% confidence level implies a lack of price impact is simply false. The science of financial economics explicitly allows for security prices to efficiently adjust to new information that even minimally affects the "present value of the expected cash flows an investor will receive from owning it," which by definition will not induce a price reaction large enough to qualify as being statistically significant at the 95% confidence level.

69. By design, the calculation of statistical significance does not entail any analysis of company-specific news. Thus, while statistical significance may be an objective manner in which to establish whether a return is extreme enough to be considered rare, it is not a necessary condition to demonstrate price impact, nor does the lack of statistical significance constitute statistical proof of the absence of price impact. As "the goodness or badness of a hypothesis cannot be decided on merely statistical grounds,"²³⁸ the determination of whether company-specific news is economically material must at least consider the content of the news itself, in order to determine if it can plausibly explain the contemporaneous price movement.²³⁹ Indeed, it

²³⁶ Bodie, Zvi, Alex Kane, and Alan J. Marcus, 2008, *Investments*, McGraw-Hill/Irwin, 7th ed., Ch. 11, p. 361.

²³⁷ *Id.* at 332.

²³⁸ McCloskey, Donald N., 1985, "The Loss Function Has Been Mislaid: The Rhetoric of Significance Tests," *The American Economic Review*, Vol. 75, No. 2, Papers and Proceedings of the Ninety-Seventh Annual Meeting of the American Economic Association, p. 203.

²³⁹ Bodie, Zvi, Alex Kane, and Alan J. Marcus, 2008, *Investments*, McGraw-Hill/Irwin, 7th ed., Ch. 11, pp. 366–368.

is my understanding that “the premise that statistical significance is the only reliable indication of causation ... is flawed,” and that such a “categorical rule would ‘artificially exclud[e]’ information that ‘would otherwise be considered significant to the trading decision of a reasonable investor.’”²⁴⁰ As acknowledged by the Third Circuit, “it does not necessarily follow from the mere absence of a statistically significant change in the stock price that there was no price impact.”²⁴¹ The Third Circuit’s view has been applied by district courts in other circuits, including in the Fifth Circuit.²⁴²

²⁴⁰ *Matrixx Initiatives, Inc. v. Siracusano*, 563 U.S. 27 (2011), quoting *Basic Inc. v. Levinson*, 485 U.S. 224 (1988).

²⁴¹ *Vizirgianakis v. Aeterna Zentaris, Inc.*, No. 18-2474, 2019 WL 2305491, at *2 (3d Cir. May 30, 2019) (quoting *West Palm Beach Police Pension Fund v. DFC Global Corp.*, No. 13-6731, 2016 WL 4138613, *14 (E.D. Pa. Aug. 4, 2016)). See also, e.g., *Carpenters*, 310 F.R.D. at 95 (“The failure of an event study to find price movement does not prove lack of price impact with scientific certainty.”).

²⁴² See, e.g., *Rooney v. EZCORP, Inc.*, 330 F.R.D. 439 450 (W.D. Tex. 2019) (“absence of a statistically significant price adjustment does not show the stock price was unaffected by the misrepresentation”); *St. Clair County Employees’ Retirement System v. Acadia Healthcare Company, Inc.*, 2022 WL 4598044, at *6 (M.D. Tenn. Sept. 30, 2022):

Defendants have still not rebutted the presumption “because their price impact arguments rely on a statistical fallacy[;] [c]ontrary to Defendants’ argument, the existence of non-statistically-significant stock price declines does not prove the absence of price impact.” *Monroe Cnty. Employees’ Ret. Sys.*, 332 F.R.D. at 393; see *id.* (“failure to find statistical significance does not prove that information had no role in the observed stock price adjustment. Rather, [n]on-significance means indeterminate with respect to finding the cause of a stock price movement; it does not mean that there was no decline or that the decline was necessarily caused by factors other than the corrective disclosure.”) (internal quotations and citations omitted); *id.* at 394 (“An event study tests whether one can reject a null hypothesis. For price impact purposes, the null hypothesis under examination is that the stock price of the subject company was not impacted by the alleged misrepresentations. It is axiomatic that ‘failure to rebut the null hypothesis does not necessarily mean that a misrepresentation had no price impact.’” (quoting Jill E. Fisch et al., *The Logic and Limits of Event Studies in Securities Fraud Litigation*, 96 Tex. L. Rev. 553, 611 (2018))); see, e.g., *Rooney v. EZCORP, Inc.*, 330 F.R.D. 439, 450 (W.D. Tex. 2019) (“A statistically significant price adjustment following a corrective disclosure is evidence the original

XI. Use of a Multi-Day Event Window Is a Reliable and Scientific Methodology for Estimating Price Impact

70. Ms. Allen states that “if new information material to investors is disclosed in an efficient market, one would expect an almost immediate reaction in the stock price to the first public announcement of such material news.”²⁴³ However, while some events, such as earnings announcements, take place at a pre-determined time, when traders can prepare themselves to act rapidly to the release of material news, it is not always a clear-cut press release or other scheduled announcement that leads to the market becoming aware of value-relevant information. Indeed, unexpected events can convey complex ramifications to firm value. Though investors may be immediately apprised of an event’s occurrence, determining the full price impact of such an event is not necessarily an instantaneous undertaking, particularly as different traders with the same information come to different conclusions as to the true price impact, and need to find willing counterparties with which to trade.

71. Indeed, asset pricing theory posits that the presence of uninformed traders and/or transactions costs induces informed traders (*i.e.*, investors that appreciate the true price impact of newly disseminated information) to refrain from immediately trading upon the arrival of material

misrepresentation did, in fact, affect the stock price. The converse, however, is not true—the absence of a statistically significant price adjustment does not show the stock price was unaffected by the misrepresentation.”); *Di Donato v. Insys Therapeutics, Inc.*, 333 F.R.D. 427, 444 (D. Ariz. 2019) (“The lack of statistically significant proof that a statement affected the stock price is not statistically significant proof of the opposite, *i.e.*, that it did not actually affect the stock price.”).

²⁴³ Allen Report, ¶26. *See also*: Allen Report, footnote 58 (“The press release was issued before the market opened on April 23, 2019 and thus any reaction to the press release, in an efficient market, would be expected on April 23, 2019.”); Allen Report, footnote 72 (“The media reports were issued during market hours on October 25, 2019 and thus any reaction to the news, in an efficient market, would be expected on October 25, 2019.”); and Allen Report, footnote 93 (“The article was released before the market opened on March 16, 2020 and thus any reaction to the news, in an efficient market, would be expected on March 16, 2020.”).

information.^{244, 245} Instead, even in generally efficient markets, informed trading occurs in a relatively gradual fashion so as to maximize the profit obtainable from informational advantage, thereby causing market prices to converge to fundamental value less than instantaneously. Moreover, when information is difficult to interpret (*i.e.*, complex), Dow and Gorton (1993) theorize that “the pattern of the price response over time may be so complicated that there is no apparent relationship between the arrival of new information and the price,” and that “[t]he potentially complex price response is caused by the complexity of the information that the traders receive.”²⁴⁶ Zhang (2006) also finds that “greater information uncertainty leads to relatively lower future stock returns following bad news and relatively higher future returns following good news, suggesting that uncertainty delays the flow of information into stock prices.”²⁴⁷ Thus, while generally efficient market prices may not always reflect fundamental value immediately, they do change in accordance with fundamental value via the market trading mechanism. But trading takes time.

72. Contrary to Ms. Allen’s assertion that “one would expect an almost immediate reaction in the stock price to the first public announcement of such material news,” academic event studies often consider the price impact of material information over multi-day event windows. For

²⁴⁴ See, *e.g.*, Grossman, Sanford J. and Joseph E. Stiglitz, 1980, “On the Impossibility of Informationally Efficient Markets,” *The American Economic Review*, Vol. 70, Issue 3, pp. 393–408; and Kyle, Albert S., 1985, “Continuous Auctions and Insider Trading,” *Econometrica*, Vol. 53, No. 6, pp. 1315–1335.

²⁴⁵ Transactions costs include directly observed costs such as trade commissions and bid-ask spreads, as well as indirect costs associated with the gathering and analyzing information pertinent to fundamental value.

²⁴⁶ Dow, James and Gary Gorton, 1993, “Trading, Communication and the Response of Asset Prices to News,” *The Economic Journal*, Vol. 103, Issue 418, pp. 639–646 at 639.

²⁴⁷ Zhang, X. Frank, 2006, “Information Uncertainty and Stock Returns,” *The Journal of Finance*, Vol. 61, pp. 105–136 at 106.

example, Mitchell and Netter (1994), authored by former SEC staff, states that one-, two-, and three-day event windows are commonly used in securities litigation:

[I]n many securities fraud cases the relevant information is revealed slowly over time, while during the same period investors receive other, sometimes unrelated, information about the firm(s) in question. In the latter case, it is relatively difficult to choose an appropriate window. The main advice is to carefully identify the exact dates during which the information in question reached the market, and then restrict the window to a short period if possible, generally two or three days around each release of new information.²⁴⁸

73. Similarly, MacKinlay (1997), a widely cited academic primer on event study analysis, explicitly allows for event windows longer than one day, stating that “[e]ven if the event being considered is an announcement on a given date it is typical to set the event window length to be larger than one. This facilitates the use of abnormal returns around the event day in the analysis.”²⁴⁹ Campbell, Lo, and MacKinlay (1997), a well-known text on financial econometrics, also describes the event window as commonly being one or two days:

For example, if one is looking at the information content of an earnings announcement with daily data, the event will be the earnings announcement and the event window might be the one day of the announcement. In practice, the event window is often expanded to two days, the day of the announcement and the day after the announcement.²⁵⁰

74. Tabak and Dunbar (2001), published in the *Litigation Services Handbook* and co-authored by two prominent NERA economists who have testified as expert witnesses, including

²⁴⁸ Mitchell, Mark L. and Jeffry M. Netter, 1994, “The Role of Financial Economics in Securities Fraud Cases: Applications at the Securities and Exchange Commission,” *The Business Lawyer*, Vol. 49, pp. 545–590 at 558, 559.

²⁴⁹ MacKinlay, A. Craig, 1997, “Event Studies in Economics and Finance,” *Journal of Economic Literature*, Vol. 35, pp. 13–39 at p. 19. According to Google Scholar, MacKinlay (1997) has been cited by at least 7,266 other academic publications.

²⁵⁰ Campbell, John Y., Andrew W. Lo, and A. Craig MacKinlay, *The Econometrics of Financial Markets*, Princeton University Press, Princeton, 1997, p. 151.

on behalf of defendants, in numerous class action securities cases, even states that event windows as long as five days can be used:

In securities fraud cases, many experts have adopted the convention of looking at one-day, two-day, or five-day periods following an announcement. The most recent academic pronouncement expresses support for the shorter one-day or two-day window, though it recognizes that in practice, analysts often use longer windows.²⁵¹

Consistent with this guidance from her NERA colleagues, as described above, Ms. Allen herself used a three-day stock price reaction following an alleged corrective disclosure to calculate plaintiff's damages under Section 10(b) in *Beckel v. Fagron Holdings USA, LLC*.^{252, 253}

75. Thus, it is clear that practitioners of event studies, whether financial economists conducting research in academia or in the arena of securities litigation, agree that the use of a multi-day event window is a reliable and scientific methodology for estimating the price impact of certain corporate events in a manner that is consistent with market efficiency. Indeed, as described in the Nye Report, in 2014, the Supreme Court acknowledged the debate among economists about the efficiency of capital markets and refused to “endorse ‘any particular theory of how quickly and completely publicly available information is reflected in market price.’”²⁵⁴

²⁵¹ Tabak, David I., and Frederick C. Dunbar, 2001, “Materiality and Magnitude: Event Studies in the Courtroom,” in *Litigation Services Handbook: The Role of the Financial Expert*, John Wiley & Sons, Inc., 3rd Ed., Ch. 19, pp. 1–22 at 4.

²⁵² *Supra* at ¶22, citing the Allen *Beckel* Report, ¶¶22–26.

²⁵³ At her deposition, Ms. Allen conceded that it is not her opinion that news is always fully impounded into a company's stock price within one trading day. (See Allen Deposition, 124:14–17.)

²⁵⁴ Nye Report, ¶17, quoting *Halliburton II*, 134 S. Ct. 2398, 2403 (2014), quoting *Basic, Inc. v. Levinson*, 485 U.S. 224, 248 at n. 28.

XII. Ms. Allen’s Alternative Event Study Does Not Have “Higher Explanatory Power”

76. Ms. Allen does not contest the event study used in the Nye Report. However, as part of her price impact analysis, she relies, in part, on an “alternative” event study.²⁵⁵ Ms. Allen’s alternative event study is similar to the event study in the Nye Report in two primary ways: (i) she uses virtually the same control periods (*i.e.*, the calendar year immediately preceding the impact date under study);²⁵⁶ and she uses the same market index (*i.e.*, the S&P 500).²⁵⁷

However, in order to control for changes in the industry, in the Nye Report, I used the S&P 500 Oil & Gas Exploration and Production Index, excluding Apache.²⁵⁸ Whereas, Ms. Allen used the S&P Oil & Gas Exploration & Production Select Industry Index, excluding Apache.²⁵⁹

77. Ms. Allen misleadingly asserts that, “[o]verall, the alternative event study has a higher explanatory power than Dr. Nye’s event study.”²⁶⁰ She claims that “on the majority of dates tested (alleged misrepresentations and alleged corrective disclosures during the Focus Period), the alternative event study has a higher adjusted R-squared than Dr. Nye’s event study.”^{261, 262}

²⁵⁵ According to Ms. Allen, her “conclusion of no price impact and no link between any of the alleged misrepresentations made during the alleged Class Period and Apache’s stock price during the Focus Period does not depend on which event study model is used.” (Allen Report, ¶34.)

²⁵⁶ See Nye Report, ¶73; See Allen Report, ¶33.

²⁵⁷ See Nye Report, ¶74; See Allen Report, ¶33.

²⁵⁸ See Nye Report, ¶75.

²⁵⁹ Allen Report, ¶33. According to S&P, “S&P Select Industry Indices are designed to measure the performance of narrow GICS® sub-industries. The index comprises stocks in the S&P Total Market Index that are classified in the GICS oil & gas exploration & production sub-industry.” (Source: <https://www.spglobal.com/spdji/en/indices/equity/sp-oil-gas-exploration-production-select-industry-index/#overview>.)

²⁶⁰ Allen Report, ¶33.

²⁶¹ Allen Report, footnote 45.

²⁶² The “R-squared (R^2)” statistic “[m]easures how well a regression equation fits the data,” and “varies between 0 (no fit) and 1 (perfect fit).” (See the Glossary of Terms to the Reference Guide on Statistics.) “[T]he adjusted R^2 ... has been suggested as a fit measure that

However, her assertions are misleading and incorrect. I compared the adjusted R-squared statistics for both regression models, and found that, on over half the days during the Class Period (59%), the event study model in the Nye Report has a higher adjusted R-squared statistic than Ms. Allen's alternative model. Thus, technically speaking, the regression model in the Nye Report has higher explanatory power, overall. Nonetheless, as shown in the following table, the adjusted R-squared statistics for both of our models are very similar across the Class Period, and specifically for dates of alleged misstatements and corrective disclosures in the Focus Period. Thus, Ms. Allen has no basis to cast doubt on the explanatory power of the regression model used in the Nye Report.

appropriately penalizes the loss of degrees of freedom that result from adding variables to the model,” and “has been found to be a preferable fit measure for assessing the fit of forecasting models.” (See Greene, William H., *Econometric Analysis*, Prentice Hall, 2012, 7th Ed., Ch. 5, p. 139.) Accordingly, adjusted R^2 is commonly used to assess the “explanatory power” of an event study to predict security prices, as opposed to the “statistical power” of an event study to accurately reject the null hypothesis, as discussed in §X above.

Period	Comparison of Model Adjusted R2		
		Nye Adj. R2	Allen Adj. R2
All Dates in CP	Average	0.659	0.643
	Median	0.667	0.654
All Dates in Focus Period	Average	0.645	0.655
	Median	0.667	0.667
Alleged Misstatements & Corrective Disclosures 2/23/2018 - 3/17/2020	Average	0.666	0.660
	Median	0.664	0.667

Alleged Misstatement / Disclosure	Date	Nye Adj. R2	Allen Adj. R2
Misstatement	2/23/2018	0.682	0.660
Misstatement	2/26/2018	0.691	0.671
Misstatement	3/26/2018	0.707	0.698
Misstatement	5/3/2018	0.671	0.686
Misstatement	5/30/2018	0.683	0.691
Misstatement	6/5/2018	0.683	0.687
Misstatement	8/2/2018	0.664	0.668
Misstatement	8/9/2018	0.645	0.648
Misstatement	9/21/2018	0.619	0.630
Misstatement	3/1/2019	0.665	0.647
Corrective Disclosure	4/23/2019	0.662	0.663
Corrective Disclosure	4/24/2019	0.662	0.664
Corrective Disclosure	4/25/2019	0.662	0.665
Corrective Disclosure	4/26/2019	0.662	0.665
Misstatement	5/2/2019	0.667	0.668
Misstatement	5/14/2019	0.664	0.675
Misstatement	8/1/2019	0.668	0.701
Corrective Disclosure	10/25/2019	0.667	0.717
Corrective Disclosure	3/16/2020	0.649	0.552
Corrective Disclosure	3/17/2020	0.649	0.553

Source: Nye Report Exhibit 11; NERA_019129

78. My work in this matter is ongoing. My opinions in this Report are subject to refinement or revision based on analysis of new information which may be provided to me, including the opinions of other experts, receipt of additional documents and data, and based on further analysis of the data and materials described herein. I understand that discovery is ongoing. Should additional relevant information be provided to me, my opinions may be supplemented at a later date.

Executed on August 11, 2023, at Redwood City, California.


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- enterprise, project, equity, debt, derivative-security and intellectual-property valuation;
- assessing the informational efficiency of financial securities;
- analyzing fairness opinions related to corporate mergers and acquisitions;
- econometric modeling and analysis;
- marginal cost analysis;
- preparing expert reports and declarations;
- providing deposition and trial testimony; and
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Oxford, UK

Trading Desk Specialist
Merrill Lynch, Defined Asset Funds

Fall 2001 – Summer 2002
Plainsboro, New Jersey

Academic Research

Nye, Zachary and Mark Washburn, 2013, “Macro-Augmented Volatility Forecasting,” *Western Decision Sciences Institute Proceedings*. Paper presented at the WDSI Annual Meeting, Long Beach, California, March 27, 2013. Winner of the 2013 Best Theoretical/Empirical Research Paper Awards.

Nye, Zachary and Philippe Jorion, 2009, “Macro-Augmented Volatility Forecasting,” Working Paper, University of California at Irvine.

Nye, Zachary and Timothy C. Johnson, 2005, “Market Efficiency's Hidden Teeth: An Unambiguous Test for Derivative Securities,” Working Paper, London Business School.

Testimony

Miriam Edwards, et al. v. McDermott International, Inc., et al., United States District Court, Southern District of Texas, Houston Division, Case No. 4:18-cv-04330
Deposition April 26, 2023

John V. Ferris, et al. v. Wynn Resorts Limited, et al., United States District Court, District of Nevada, Case No. 2:18-cv-00479-GMN-DJA
Deposition August 26, 2022
Deposition January 31, 2023

In re Jernigan Capital, Inc. Securities Litigation, United States District Court, Southern District of New York, Case No. 1:20-cv-09575-JLR
Deposition January 27, 2023

Halman Aldubi Provident and Pension Funds Ltd., et al. v. Teva Pharmaceuticals Industries Limited, et al., United States District Court, Eastern District of Pennsylvania, Case No. 2:20-cv-04660-KSM
Deposition November 4, 2022

Ali Karimi, et al. v. Deutsche Bank AG, et al., United States District Court, Southern District of New York, Case No. 1:22-cv-02854-JSR
Deposition August 12, 2022

Teresa Daskocz, et al. v. ALS Lien Services, et al., Superior Court of California, County of Contra Costa, Case No. C17-01486
Deposition April 23, 2018
Deposition March 8, 2022
Deposition April 14, 2022
Trial April 29, 2022

Paul Hayden, et al. v. Portola Pharmaceuticals, Inc., et al., United States District Court, Northern District of California, Case No. 3:20-cv-00367-VC
Deposition March 30, 2022

United States of America ex rel. Lori Morsell, et al. v. Symantec Corporation, United States District Court for the District of Columbia, Civil Action No. 12-cv-0800 (RC)

Deposition March 13, 2019

Trial March 22, 2022

United States of America ex rel. Tiffany Montrieff, et al. v. Peripheral Vascular Associates, P.A., United States District Court for the Western District of Texas, San Antonio Division, Civil Action No. SA-17-CV-00317-XR

Deposition July 31, 2020

Trial February 14, 2022

In re Advance Auto Parts, Inc. Securities Litigation, United States District Court, District of Delaware, Case No. 1:18-CV-00212-RGA

Deposition July 14, 2020

Deposition September 30, 2021

In re Allergan PLC Securities Litigation, United States District Court, Southern District of New York, Civil Action No. 18-CV-12089-CM

Deposition May 19, 2020

Deposition September 27, 2021

Gabby Klein, et al. v. Altria Group, Inc., et al., United States District Court, Eastern District of Virginia, Richmond Division, Case No. 3:20-cv-00075-DJN

Deposition August 31, 2021

In re Tahoe Resources, Inc. Securities Litigation, United States District Court, District of Nevada, Case No. 2:17-cv-01868-RFB-NJK

Deposition August 4, 2021

Hawaii Structural Ironworkers Pension Trust Fund, et al. v. AMC Entertainment Holdings, Inc., et al., United States District Court, Southern District of New York, Case 1:18-cv-00299-AJN-SLC

Deposition July 9, 2020

Deposition July 28, 2021

In re Mylan N.V. Securities Litigation, United States District Court, Southern District of New York, Case No. 1:16-CV-07926 (JPO)

Deposition November 22, 2019

Deposition July 20, 2021

Oregon Laborers Employers Pension Trust Fund, et al. v. Maxar Technologies Inc., et al., United States District Court, District of Colorado, Case No. 1:19-cv-00124-WJM-SKC

Deposition May 28, 2021

Roei Azar, et al. v. Yelp, Inc., et al., United States District Court, Northern District of California, Case No. 3:18-cv-00400-EMC

Deposition March 2, 2021

Roofers' Pension Fund, et al. v. Joseph C. Papa, et al., United States District Court, District of New Jersey, Civil Action No. 2:16-cv-02805-MCA-LDW

Deposition April 2, 2019

Deposition January 14, 2021

Utah Retirement Systems, et al. v. Healthcare Services Group, Inc., et al., United States District Court, Eastern District of Pennsylvania, Case No. 2:19-cv-01227-ER

Deposition December 10, 2020

Matt Karinski, et al. v. Stamps.com, Inc., et al., United States District Court, Central District of California, Case No. 2:19-cv-01828-MWF-SK

Deposition August 14, 2020

Alexandre Pelletier, et al. v. Endo International PLC, et al., United States District Court, Eastern District of New Pennsylvania, Civil Action No. 2:17-cv-05114-MMB

Deposition July 27, 2020

In re Zillow Group, Inc. Securities Litigation, United States District Court, Western District of Washington at Seattle, Case No. 2:17-cv-01387-JCC

Deposition March 10, 2020

Joseph Prause, et al. v. TechnipFMC plc, et al., United States District Court, Southern District of Texas, Houston Division, Case No. 4:17-cv-02368

Deposition February 5, 2020

Deposition March 9, 2020

In re Quorum Health Securities Litigation, United States District Court, Middle District of Tennessee, Case No. 3:16-cv-02475

Deposition August 17, 2018

Deposition January 14, 2020

In re Snap Inc. Securities Litigation, United States District Court, Central District of California, Western Division, Case No. 2:17-cv-03679-SVW-AGR

Deposition December 13, 2019

Jet Capital Master Fund, L.P., et al. v. American Realty Capital Properties, Inc., et al., United States District Court, Southern District of New York, Case No. 1:15-cv-00307-AKH

Deposition July 26, 2019

City of Pontiac General Employees' Retirement System, et al. v. Dell Inc., et al., United States District Court, Western District of Texas, Austin Division, Case No. 1:15-cv-00374-LY

Deposition April 19, 2017

Deposition November 6, 2018

Pirnik v. Fiat Chrysler Automobiles N.V., et al., United States District Court, Southern District of New York, Case No. 1:15-CV-07199-JMF

Deposition February 2, 2018

Deposition September 13, 2018

Bradley Cooper, et al. v. Thoratec Corporation, et al., United States District Court, Northern District of California, Oakland Division, Case No. 4:14-cv-00360-CW

Deposition March 6, 2018

L-3 Communications Corporation, et al. v. Serco, Inc., United States District Court for the Eastern District of Virginia, Case No. 1:15-cv-701-GBL-JFA

Deposition October 22, 2015

Deposition October 18, 2017

In re Juno Therapeutics, Inc., United States District Court of Western District of Washington at Seattle, Case No. C16-1069RSM

Deposition October 4, 2017

Brad Mauss, et al. v. NuVasive, Inc., et al., United States District Court, Southern District of California, Case No.: 13-cv-02005-JM

Deposition December 20, 2016

Deposition August 28, 2017

In re Akorn, Inc. Securities Litigation, United States District Court, Northern District of Illinois, Eastern Division,
Case No. 15-CV-01944

Deposition June 21, 2017

In re Ocwen Financial Corporation Securities Litigation, United States District Court, Southern District of Florida,
Case 14-81057-CIV-WPD

Deposition September 23, 2016

Deposition March 28, 2017

Stephen Calfo, et al. v. John P. Messina, Sr., et al., United States District Court, Southern District of New York,
Civil Action No. 15 Civ. 04010 (LGS)

Deposition January 5, 2017

In re EZCORP, Inc. Securities Litigation, United States District Court, Southern District of New York, Case No. 14-
cv-6834 (ALC)

Deposition October 14, 2016

Arthur Menaldi, et al. v. Och-Ziff Capital Management Group LLC, et al., United States District Court, Southern
District of New York, No. 14-CV-03251-JPO

Deposition October 3, 2016

Keith Thomas, et al. v. MagnaChip Semiconductor Corp., et al., United States District Court, Northern District of
California, Case No. 3:14-cv-01160-JST

Deposition September 16, 2016

In re Rocket Fuel, Inc. Securities Litigation, United States District Court, Northern District of California, Oakland
Division, Case No. 4:14-cv-03998-PJH

Deposition September 14, 2016

Barbara Strougo, Individually and on Behalf of All Others Similarly Situated v. Barclays PLC, et al., United States
District Court, Southern District of New York, Case No. 14-cv-5797 (SAS)

Deposition August 11, 2015

Evidentiary Hearing November 5, 2015

Deposition June 16, 2016

In re Merck & Co., Inc. Securities, Derivative & “ERISA” Litigation, United States District Court, District of New
Jersey, Case Numbers: 05-cv-5060; 07-cv-4021; 07-cv-4022; 07-cv-4023; 07-cv-4024; 07-cv-4546; 11-cv-6259; and
15-cv-518

Deposition December 6, 2013

Deposition October 1, 2015

Richard Thorpe and Darrel Weisheit, Individually and on Behalf of All Others Similarly Situated v. Walter
Investment Management Corp., et al., United States District Court, Southern District of Florida,
Case No. 1:14-cv-20880-UU

Deposition September 16, 2015

City of Austin Police Retirement System, *Individually and on Behalf of All Others Similarly Situated* v. Kinross
Gold Corporation, et al., United States District Court, Southern District of New York,
Civil Action No. 1:12-cv-01203-VEC-KNF

Deposition November 19, 2014

In re El Paso Partners, L.P. Derivative Litigation, Court of Chancery of the State of Delaware, C.A. No. 7141-CS

Deposition September 24, 2013

Trial November 12 and 13, 2014

L-3 Communications Corporation, et al. v. Jaxon Engineering & Maintenance, Inc., et al., United States District Court for the District of Colorado, Civil Action No. 10-cv-02868-MSK-KMT

Deposition August 7, 2014

Axa Corporate Solutions Assurance, et al. v. Honeywell International, Inc., et al., Superior Court of the State of Arizona in and for the County of Maricopa, No. CV2011-019334

Deposition February 24, 2014

In re Heckmann Corporation Securities Litigation, United States District Court for the District of Delaware, Case No. 1:10-cv-00378-LPS-MPT

Deposition November 9, 2012

Exhibit 2**Apache Corporation****Analyst Price Targets and Rating Actions Surrounding Event Date**

Source: Bloomberg

9/7/2016	Apache Announces Alpine High				
Firm	Price Target as of 9/6/2016	Price Target as of 9/12/2016	% Change in Price Target	Pre-Event Rating Action	Post-Event Rating Action
Alembic Global Advisors	\$75.00	\$75.00	0.00%	overweight	overweight
Argus Research Company				hold	hold
Atlantic Equities	\$41.00	\$70.00	70.73%	neutral	overweight
Barclays	\$50.00	\$50.00	0.00%	equalweight	equalweight
Bernstein	\$61.00	\$69.00	13.11%	outperform	outperform
BMO Capital Markets	\$60.00	\$60.00	0.00%	market perform	market perform
Capital One Securities	\$55.00	\$60.00	9.09%	equalweight	equalweight
Citi	\$53.00	\$58.00	9.43%	neutral	neutral
CLSA	\$57.00	\$57.00	0.00%	underperform	underperform
Cowen	\$56.00	\$56.00	0.00%	market perform	market perform
Credit Suisse	\$63.00	\$67.00	6.35%	neutral	neutral
Deutsche Bank	\$53.00	\$57.00	7.55%	hold	hold
Edward Jones				buy	buy
Evercore ISI	\$60.00	\$62.00	3.33%	hold	hold
Goldman Sachs	\$62.00	\$63.00	1.61%	neutral/attractive	neutral/attractive
IBERIA Capital Partners	\$60.00	\$60.00	0.00%	sector perform	sector perform
ISS-EVA				overweight	overweight
Jefferies	\$42.00	\$47.00	11.90%	underperform	underperform
Johnson Rice				accumulate	accumulate
JP Morgan	\$55.00	\$55.00	0.00%	neutral	neutral
KLR Group	\$71.00	\$71.00	0.00%	buy	buy
Macquarie	\$52.00	\$54.00	3.85%	neutral	neutral
Morgan Stanley	\$61.00	\$63.00	3.28%	Equalwt/Attractive	Equalwt/Attractive
Morningstar				hold	sell
Nomura	\$42.00	\$42.00	0.00%	reduce	reduce
Peters & Co.	\$50.00	\$50.00	0.00%	sector underperform	sector underperform
Piper Sandler & Co	\$68.00	\$68.00	0.00%	overweight	overweight
Raymond James	\$70.00	\$70.00	0.00%	outperform	outperform
RBC Capital	\$60.00	\$62.00	3.33%	sector perform	sector perform
Scotiabank	\$70.00	\$70.00	0.00%	sector outperform	sector outperform
Seaport Global	\$53.00	\$53.00	0.00%	neutral	neutral
Societe Generale	\$65.00	\$65.00	0.00%	buy	buy
TPH&Co.	\$52.00	\$52.00	0.00%	hold	hold
Wells Fargo				outperform	outperform
Wolfe Research	\$44.00			underperform	peerperform
Total	\$57.28	\$60.21	5.13%		